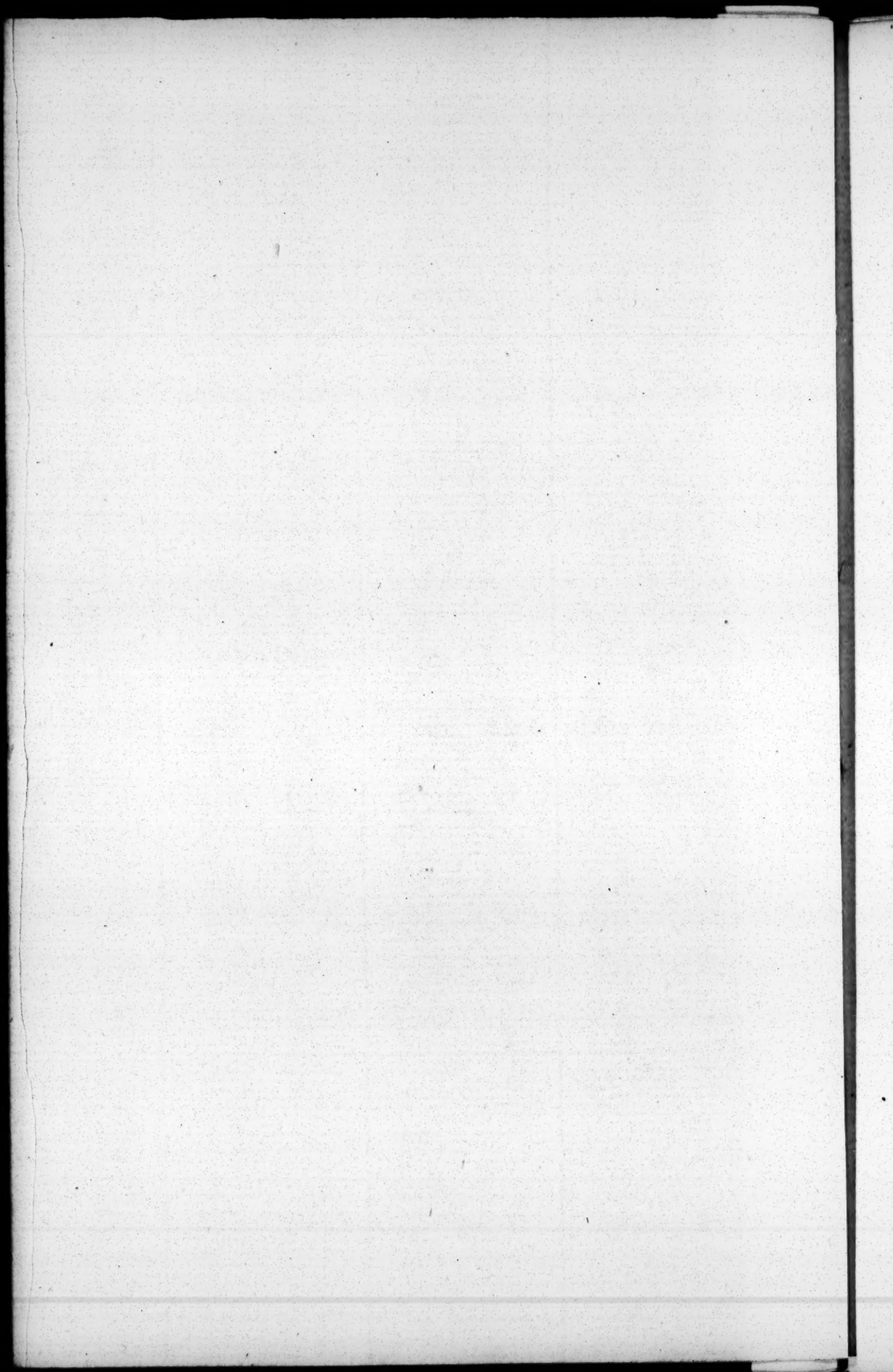


A
SYLLABUS
OF
LECTURES
ON
CHYMISTRY.

BY

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CHYMISTRY is that Branch of Natural Philosophy which treats of the particular Properties of Bodies, and is thereby distinguished from Mechanical Philosophy, which treats of the general Properties of Bodies,

C H A P. I.

O F T H E

O B J E C T S O F C H Y M I S T R Y.

THE PARTICULAR OBJECTS of Chymistry may be referred to the FORMS of SALINE, INFLAMMABLE, METALLIC, EARTHY, WATERY, and perhaps AERIAL. And Bodies perhaps the most compounded in Nature, may be reduced to one or other of the above Forms.

S E C T I.

SALINE BODIES are SIMPLE or COMPOUND; They are soluble in Water, and sapid.

The SIMPLE SALTS are ACID or ALKALINE;

ACIDS are four, they change the Syrup of Violets and other vegetable Elues to a red Colour, and they effervesce with Alkaline Salts containing Air.

ALKALINES change the Syrup of Violets or blue vegetable Juices to a green Colour, containing Air, they effervesce with Acids.

The ACIDS are VITRIOLIC, NITROUS, MURIATIC, and VEGETABLE.

Of the last there are four principal Species. 1. The NATIVE, *Succus Limonum*, &c. 2. The FERMENTED, *Acetum*, *Tartarum*. The DISTILLED, *Acidum Abietis*. 4. The SUBLIMED, *Flores Benzoin*.

Of the FOSSIL ACIDS there are Three, whose Properties have been but lately discovered.

1. *Sal. Succini*. 2. *Sal. Sedativum Hombergii*. 3. *Acidum Arsenici*.

The ANIMAL KINGDOM affords us the

1. *Acidum Formicarum*, and 2. *Acidum Urinae*:

The Enumeration of the Four principal Species is sufficiently proper for our Purpose.

The ALKALINES are FIXED or VOLATILE.

The FIXED have no Smell, and are capable of sustaining a great Degree of Heat without Diffipation—*Sal. Tartari*, &c.

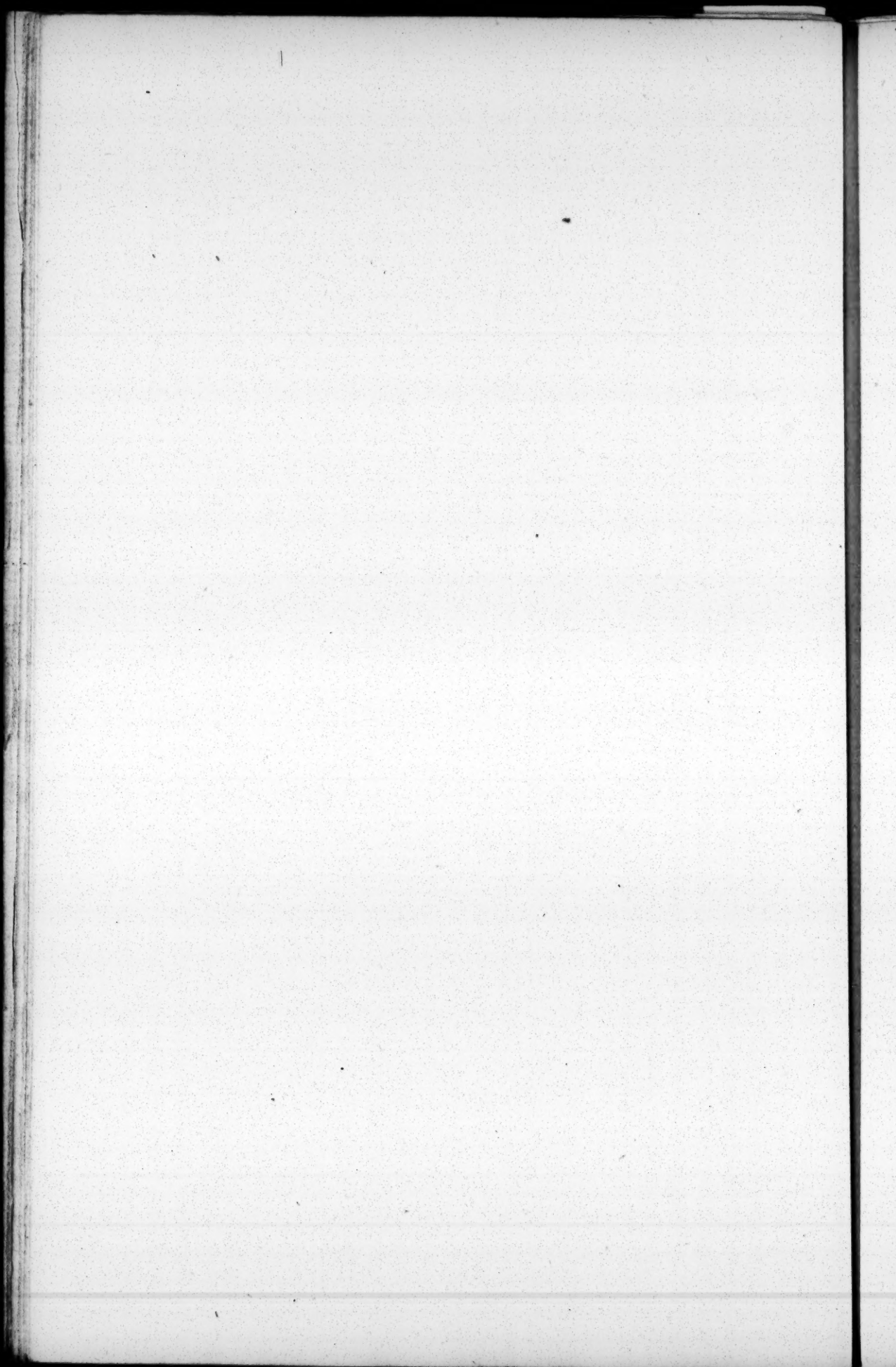
The VOLATILE are dissipated by a gentle Heat, and have a strong pungent Odour—*Sal. Volat. Ammon.* &c.

The COMPOUND SALTS are NEUTRAL, METALLIC, and EARTHY.

The NEUTRAL are such as have an ACID for One Ingredient, and an ALKALI for another, united together in that Proportion so as not to change the Colour of Syrup of Violets, or vegetable Blues, and not to effervesce upon the Addition of either Acid or Alkali. *Nitre*, &c.

The METALLIC are such as have an ACID for One Ingredient, and a METAL for another. *Vitriols*.

The EARTHY have an ACID for One Ingredient, and an EARTHY for the other. *Alum*, &c.



S E C T. II.

INFLAMMABLE BODIES are in the Forms of **OIL**, **SULPHUR**, and **ARDENT SPIRIT**, each of them supposed to depend upon a **PHLOGISTON**.

They are such as when applied to burning Bodies, or when having a certain Degree of Heat generated in them, are set on fire, and continue burning until their whole Mass is consumed, and a luminous Vapour, called Flame, always appears upon their Surface.

They are to be distinguished from Bodies only capable of Ignition.

OILS are **ANIMAL**, **VEGETABLE**, and **FOSSIL**.

ANIMAL and **VEGETABLE OILS** are **EXPRESSED**, **ESSENTIAL**, and **EMPYREUMATIC**.

EXPRESSED OILS are of a bland and mild Taste, without any sensible Odour, and not soluble in ardent Spirits. *Adeps. Ol. Olivaram, &c.*

ESSENTIAL OILS are of a remarkable Odour, and acrid Taste, resembling the Substances from which they are taken; they are soluble in Spirits of Wine, *Ol. Lavendul. Essentia Limonum, Moschus, Balsamum, Resina, &c.*

EMPYREUMATIC OILS have a sensible Smell, and Empyreumatic Taste, not resembling the Substances from which they are obtained, but depending upon the Degree of Heat applied during their Distillation—*Ol. Cornu Cervi, &c.*

FOSSIL OIL is of One Kind only:

It has a Taste and Odour different from the Empyreumatic, and they are difficultly soluble in Spirit of Wine—*Naptha, Petroleum, Bitumina, &c.*

To the Head of **OILS** belongs **ÆTHER**, which is a Fluid of considerable Volatility, and miscible with ardent Spirits.

SULPHUR is a dry friable Body, not miscible with water. It is of one Kind only in English, named Brimstone,

stone, but in Latin is called by the Epithet of MINERAL, to distinguish it from the *Soufre Principe*, which is the PHLOGISTON of the Chymists.

ARDENT SPIRITS are miscible with Water, and of little specific Gravity.

They are the Product of Fermentation, the chief Example is *Spirit of Wine*, which in its greatest Purity is named *Alcohol*.

S E C T. III.

METALLIC SUBSTANCES are METALS, or SEMI-METALS:

They are opake Bodies, of considerable specific Gravity, fusible in the Fire, and after being cooled, concrete in the same Form as before.

METALS are MALLEABLE. *Gold, Silver, Quick-silver, Lead, Tin, Copper, and Iron.*

The Two First are said to be NOBLE and PERFECT, the Four last are named BASE and IMPERFECT METALS.

SEMI-METALS are not MALLEABLE. *Zinc, Antimony, Bismuth, Arsenic, Platina, Cobalt, and Nickel.*

METALLIC SUBSTANCES, as found in the Earth, are commonly found in the State of ORE mineralised with *Sulphur and Arsenic.*

When this ORE is dispersed among stony or earthy Substances it is said to be inherent in a MATRIX.

PYRITES is a Term chiefly applied to Sulphur when combined with Metals in so large a Proportion as to render the extracting of it profitable.

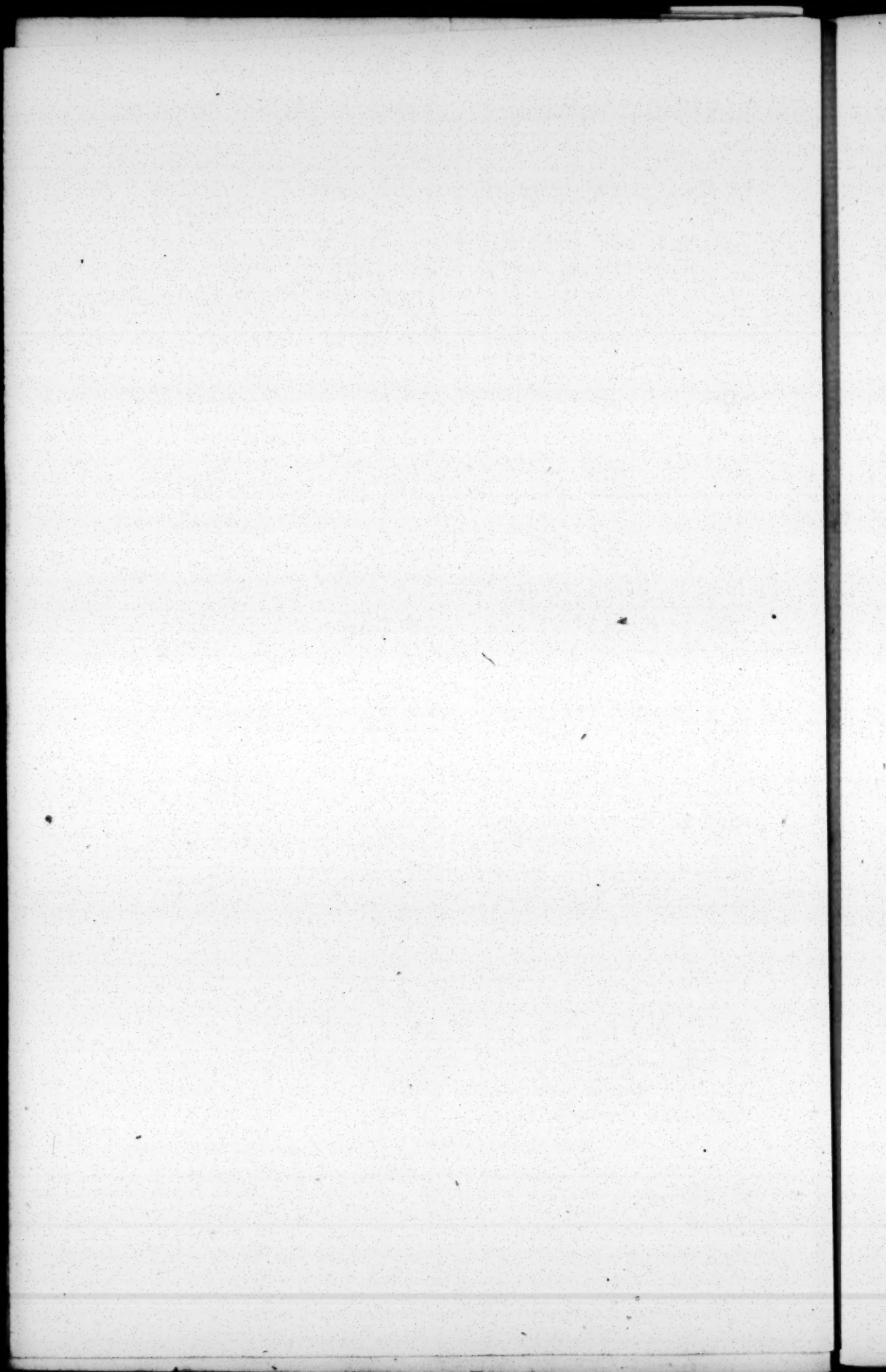
S E C T. IV.

EARTHY BODIES are found in a dry and solid Form, are not inflammable, and, after Fusion, concrete again in the Form of Glafs. They are of four Kinds:

1. ABSORBENT, otherwise named *Alkaline*, and sometimes, though improperly, termed *calcareous*.

They are soluble in Acids.—*Magnesia, &c.*

2. CRYST.



2. CRYSTALLINE, otherwise named *Vitrescent*—
They are not soluble in Acids, and strike fire with Steel—
Precious Stones, Flints, &c.

3. ARGILLACEOUS, are not soluble in Acids, do not
strike fire with Steel, and are ductile upon the Addition of
Water—*Clays and Boles.*

4. TALKY, are of a fibrous or laminated Structure, not
soluble in Acids, and incombustible in the Fire—*Asbestos,*
&c.

S E C T. V.

WATERY BODIES are COMMON or MINERAL.

S E C T. VI.

AERIAL BODIES are COMMON or MEPHITIC.

They are permanently Elastic Fluids.

C H A P. II.

O F T H E
O P E R A T I O N S O F C H Y M I S T R Y .

The CHANGES of the Qualities of Bodies produced by Chymistry, are all of them produced by COMBINATION or SEPARATION.

COMBINATION depends upon ATTRACTION, and this upon FLUIDITY, which is employed in SOLUTION or FUSION.

SEPARATION depends upon ELECTIVE ATTRACTION, or the ACTION of FIRE.

ELECTIVE ATTRACTION is ABSOLUTE or RELATIVE, SINGLE, or DOUBLE.

In all Cases, as Attraction in general, the Elective depends upon FLUIDITY; and therefore, also upon SOLUTION or FUSION.

The FIRE separates Bodies in consequence of their different Degrees of FUSIBILITY, and acts by FUSION: or their different Degrees of VOLATILITY, and then acts by EXHALATION.

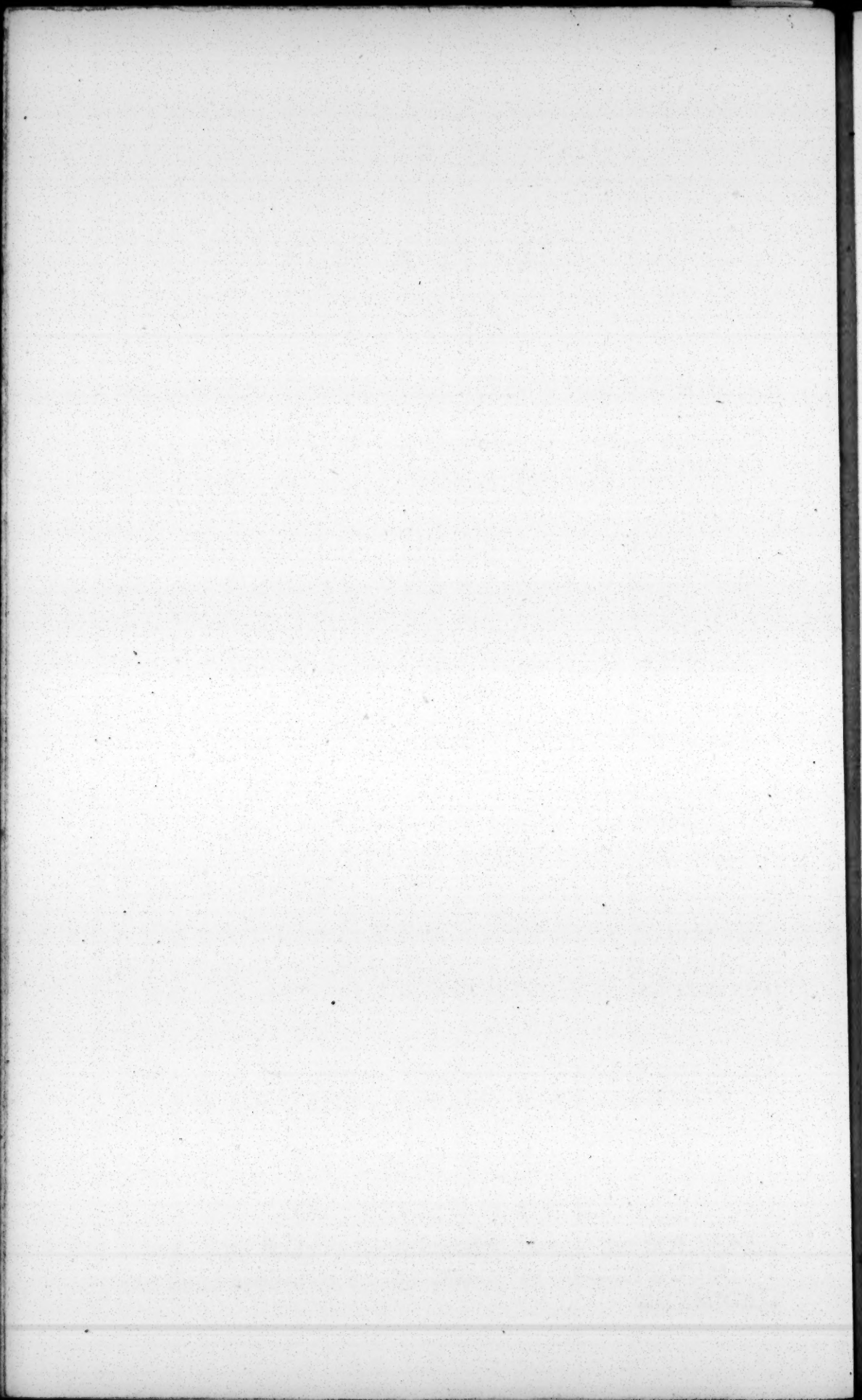
Hence all the several Operations of Chymistry may be referred to SOLUTION, FUSION, or EXHALATION.

S E C T. I.

O F S O L U T I O N .

The solid Body to be dissolved is named the SOLVEND, the Fluid applied to it, the *Solvent* or MENSTRUUM.

CHYMICAL



CHYMICAL SOLUTION is to be distinguished on one Hand from DIFFUSION, which has been named *Mechanical Solution*; and on the other, from PROPER MIXTURE.

Both in SOLUTION and MIXTURE there happens a SATURATION.

The Vessels commonly, and most properly, employed in Solution, are named MATRASSES or BOLT-HEADS. When a Matrafs is closed, by another smaller, inverted and joined to it, this is called a CIRCULATORY APPARATUS.

SOLUTION is assisted by the DIVISION of the Solvend; the AGITATION of the VESSEL, the Application of HEAT and of AIR.

In the Practice of Solution, it is commonly proper to avoid EFFERVESCENCE and DISSIPATION.

The *intestine Motion*, named EFFERVESCENCE, is to be distinguished from those of EBULLITION and FERMENTATION.

SOLUTION, according to certain Differences in the Practice, is named MACERATION, INFUSION, DECOCTION, DIGESTION, CIRCULATION, DELIQUESCENCE, or AMALGAMATION.

DISSOLVED Bodies may be separated from their Menstruums, by PRECIPITATION, CHRYSTALLIZATION, and EVAPORATION.

PRECIPITATION belongs to this Head. It depends upon *Elective Attraction*, and the Body added is named the PRECIPITANT.

There are Four Cases of Precipitation; 1. Of the DISSOLVED Body alone. 2. Of the DISSOLVED Body, with the PRECIPITANT. 3. Of the Menstruum alone. 4. Of the MENSTRUUM, with the PRECIPITANT.

In the Two first Cases, the dry Body falling down is named **PRECIPITATE**, *Magistery*, or *Calx*.

When a Metallic Substance can be combined with an Acid, in a dry Form only, the Combination is named **CORROSION**.

When a **PRECIPITATE** has a Part of the **ACID**, which had formerly dissolved it, still adhering to it, the washing of that Acid by Water is named **EDULCORATION**.

In most of the Practices of this Section there is Occasion for **COLATURE** and **FILTRATION**, which are facilitated by a previous **DEPURATIO** *per subsiditiam*.

Most Instances of **COAGULATION** may be referred to **PRECIPITATION**.

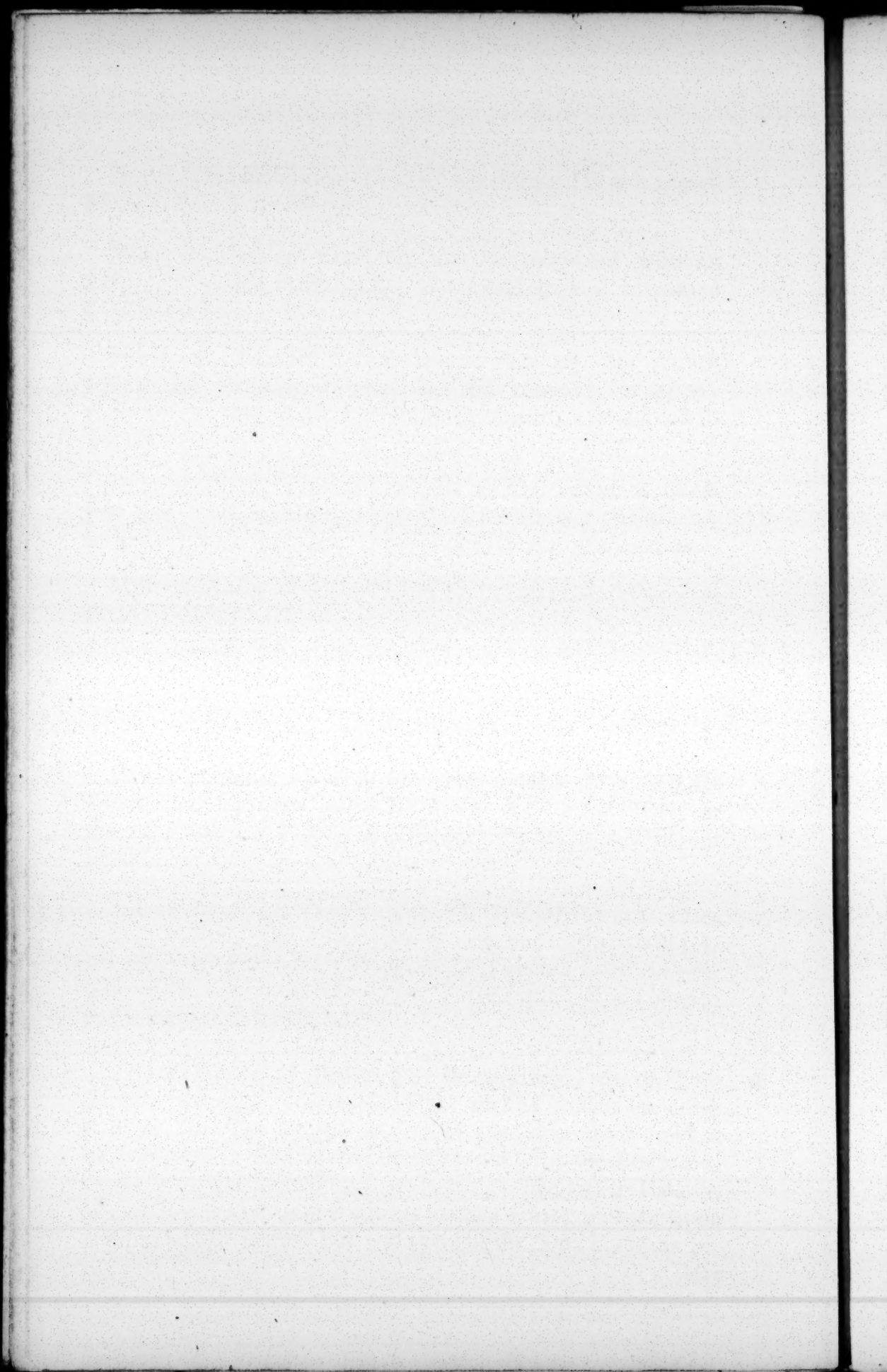
S E C T. II.

O F F U S I O N.

Fusion combines by what has been named **DRY SOLUTION**, and separates by **ELECTIVE ATTRACTION**, or the **ACTION OF FIRE**, in different Degrees upon different Bodies.

When an **ELECTIVE ATTRACTION** takes Place under Fusion, the Operation is named a **PRECIPITATION BY FUSION**, *Præcipitatio fusoria*; and in the Case of Metallic Substances, the Parts separated are named **SCORIÆ** and **REGULUS**.

The **FUSION** of Bodies may be considered as of Two Kinds; the One, where the Body melted suffers no other Change but that by the Action of the Fire, from solid it becomes fluid; and upon removing the Fire the Body concretes into the same Form as before. The other Case is, where the Body melted suffers such a Change, that, upon cooling again, it does not concrete in the same Form as before



fore. Of this, the most noted Instance is in the **VITRIFICATION** of Bodies.

The Fire separates under Fusion, by acting upon the **COMMON FUSIBILITY**, or by acting upon the **VITRESCENCY** of particular Bodies.

Upon the First depend **ELIQUATION** and **CONGELATION**.

Upon the Second depend **SCORIFICATION** and **CUPELLATION**.

When a Metallic Substance has been deprived of its Metallic Form; and is, by certain Means, under Fusion, brought back to it again, the Operation is named **REDUCTION**.

The Vessels most commonly employed in Fusion are named **CRUCIBLES**.

In Scorification, &c. are employed **TESTS**, **CUPELS**, and **MUFFLES**.

S E C T. III.

O F E X H A L A T I O N.

EXHALATION is various, as it is practised for obtaining

{	The fixed Parts
	{ of Fluids by EVAPORATION , or of Solids by USTULATION , or CALCINATION .
{	The Volatile Parts
	{ in a Fluid Form by DISTILLATION . in a Solid Form by SUBLIMATION .

Of a like Nature with these Two last, but somewhat different in the Manner of operating, are **CEMENTATION** and **INFLAMMATION**.

Under the last is comprehended what has been named the *Sublimation of Geber*.

EVAPORATION, according to certain Circumstances of the Subject, is named INSPISSATION or EXTRACTION.

CRYSTALLIZATION sometimes depends upon diminishing the HEAT, but as more commonly upon diminishing the QUANTITY of the Menstruum, it belongs to this Head.

EVAPORATION is properly carried on by the joint Action of FIRE and AIR.

DISTILLATION, according to the Subject, is distinguished into SIMPLE DISTILLATION, and DISTILLATION with ADDITION.

SIMPLE DISTILLATION is otherways, but improperly, named *the Chemical Analysis*.

In DISTILLATION with ADDITION, this is made for several Purposes.

1. By an ELECTIVE ATTRACTION, for setting loose a volatile Part.
2. By the same for fixing one of two volatile Parts.
3. By the same, for separating a fixed Part, and by uniting with this for volatilizing it.
4. By uniting with the Whole of a Mixt, for volatilizing it.
5. By dividing an Aggregate, for preventing its Fusion, and thereby for favouring its Resolution.
6. By dividing an Aggregate, for preventing its Intumescence, and thereby favouring the Separation of the Parts resolved.
7. For regulating the Degree of Heat.

When a Matter obtained by one Distillation is subjected to a second, that it may be more entirely separated from Matters

Matters that adhered to it in the first; such second Distillation is named RECTIFICATION, DEPHLEGMATION, or CONCENTRATION.

When, in the Cases Third and Fourth, a Matter obtained by one Distillation, is returned upon the same Matter it had been drawn from before, to be again distilled from it, for obtaining a stronger Impregnation; such second Distillation is named a COHOBATION.

DISTILLATION, according to the Form of the Vessels employed, is distinguished into

1. That *per ascensum*, in which the CUCURBIT and ALEMBIC are employed.
2. That *per obliquum*, in which the RETORT is employed.
3. That *per descensum*, in which the Vapours are driven into a Vessel placed below the Matter from which they are drawn.

In the PRACTICE of DISTILLATION, Regard is to be had to the Choice of Vessels in Matter and Form.

To the Manner of putting the Matter into the distilling Vessels, and filling them to a proper Degree.

To the closing the Junctures of the Vessels, by LUTING, or otherways.

To the proper Application of the Fire.

To the preventing a too great Intumescence of the Matters subjected to Distillation.

To prevent the bursting of the Vessels by the Quantity, or the Elasticity of the Vapours raised in the Distillation.

To prevent the Matter distilled from concreting in the Neck of the Retort, in such Quantity as to shut it up.

To the assisting the Distillation, by throwing Air into the distilling Vessels.

To the Separation, where it is proper, of the several Matters arising successively in Distillation.

To the opening of the Vessels, when the Operation is finished.

To the Separation of different Matters that have been collected in one and the same Receiver.

To

To attend to the Nature of the Fumes escaping from the Vessels in the Course of the Operation.

SUBLIMATION is conducted upon the same Principles as Distillation. Its Products are different, as they are in Powder, when they are named FLOWERS, or as they are in solid Concretes, when they are named SUBLIMATES.



APPENDIX TO CHAPTER II.

OF THE

APPLICATION OF FIRE.

In the Application of the HEAT communicated by burning Bodies, we consider the DIRECTION of it, and the REGULATION of its Degree.

The DIRECTION is of Three Kinds.

1. The NAKED, or *open* Fire.
2. The REVERBERATORY Fire.
3. The TRANSMITTED Heat.

The first is employed where a greater Degree of Heat is required.

Where the Matter to be acted upon cannot be committed to Vessels.

Where the Matter to be acted upon is not hurt by the Contact of the burning Fuel.

Where the Vessels employed are fit to sustain the immediate Action of the burning Fuel.

Where, in the Course of the Operation, it may be necessary suddenly to withdraw the Fire.

The REVERBERATORY Fire is employed where a great Degree of Heat is required.

Where the Heat is to be applied to a great Quantity of Matter, or to a great Number of Vessels at the same Time.

Where the immediate Contact of the Fuel would disturb the Operation.

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Where it is useful to inflame and consume the Smoke arising from the burning Fuel.

Where this Direction of the Fire is best suited for collecting the Matters melted by it.

The TRANSMITTED HEAT is employed where a moderate Degree of Heat only is required.

Where a very gradual, and exactly conducted Application of Heat is necessary.

Where an exactly determined Degree of Heat is necessary.

Where the Matters operated upon may be hurt by a Communication with the Fuel and Flame, or the Smoke arising from them.

Where the Vessels employed are not fit to sustain the immediate Action of burning Fuel.

The REGULATION of the Degree of Heat depends upon, 1. The Nature of the Fuel. 2. The Quantity of the Fuel enflamed. 3. The more or less entire Inflammation of the Fuel. 4. The quicker or slower Inflammation of the Fuel depending upon the Velocity of the Air applied, determined by *Bellows*, a *Water Blast*, an *Æolipile*, or the *Structure Furnaces*. 5. The more or less Confinement of the Heat arising from the burning Fuel.

By these Considerations of the DIRECTION and REGULATION of HEAT, is determined the Construction of FURNACES.

The PARTS of a Furnace may be the *Asb-hole*, the *Focus*, the *Laboratory*, the *Chimney*.

The chief SPECIES of *Furnaces* are the *Forge*, the *melting Furnace*, the *distilling Furnace* with a *naked Fire*, the *Assay Furnace*, the *Reverberatory distilling Furnace*, the *Iron Founders Furnace*, the *Potters Furnace* or *Kiln*, the *distilling Sand Furnace*, the *Athanor*, the *Lamp Furnace*.



OF THE
CHEMICAL PROPERTIES
OF
B O D I E S.

O F S A L T S,

I. VITRIOLIC ACID.

SYNONIMA.

Oil of Vitriol.
Icy Oil of Vitriol.
Spirit of Vitriol.
Oil of Sulphur.
Universal Acid.
Acidum universale Catholicum Primigenium.
Acidum æreum Atmosphericum.
Acidum vagum Fossile.
Spiritus Vitrioli tenuis & fortis.
Spiritus Sulphuris per Campanam.
Aqua Sulphurata.
Gas Sulphuris.
Acidum Sulphuris volatile.
Spiritus Aluminis.

Its specific Gravity to Water is as 17 to 8.
It attracts Moisture from the Air.
It requires about 600 Degrees of Heat to boil it.
It is much more fixed than Water.

It unites with

I. FIXED VEGETABLE ALKALI.
Vitriolated Tartar.

II. FOSSIL ALKALI.
Glauber's Salt.

III. VOLATILE ALKALI.
Vitriolic Ammoniac.

IV. PHLOGISTON.
Volatile Acid of Sulphur.

V. PHLOGISTON *more intimately*.
Sulphur.

VI. ALCOHOL.
Vitriolic Æther.
Spiritus Vitrioli dulcis.
Oleum dulce.

VII. WITH OILS *producing much Heat and Flame*.
Bitumens.

VIII. ZINC.
Vitriol of Zinc.
White Vitriol.
Sal Vitrioli.

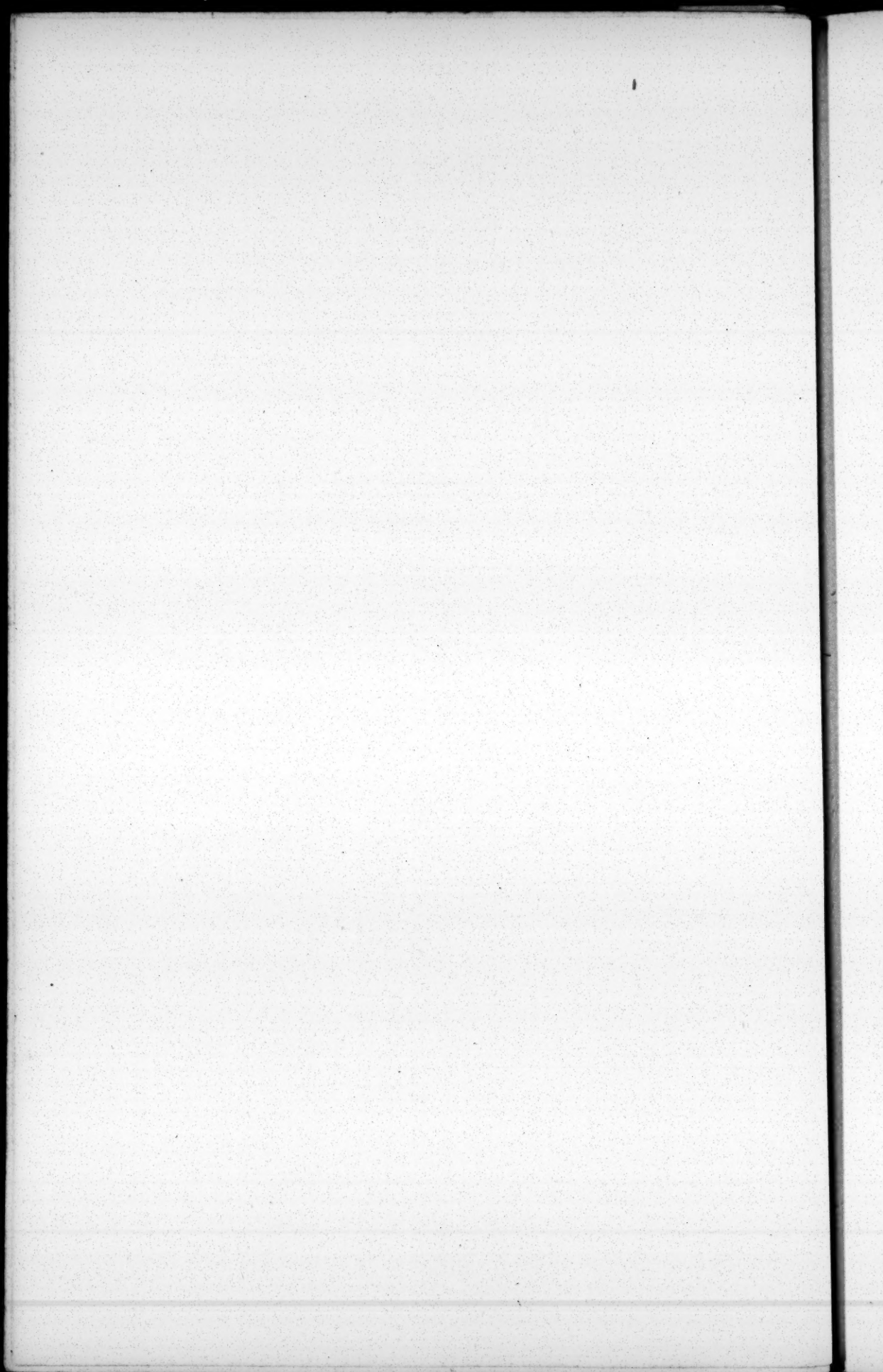
IX. NICKEL.
Vitriol of Nickel.

X. COBALT.
Vitriol of Cobalt.

XI. IRON.
Green Vitriol.
Sal Martis.
Tinct. Styptica, P: L:

XII. COPPER.
Blue Vitriol.





XIII. SILVER.

Vitriol of Silver.

XIV. TIN.

Vitriol of Tin.

XV. LEAD.

Vitriol of Lead.

XVI. MERCURY.

Turbith Mineral.

Mercurius emeticus flavus.

XVII. ANTIMONY.

Antimonium vitriolatum Werholf.

XVIII. CALCAREOUS EARTH.

Selenites.

Gypfum.

Plaister of Paris.

XIX. CLAY or EARTH of ALUM.

Alum.

XX. MAGNESIA.

Epsom Salt.

XXI. WATER.

Spiritus Vitrioli tenuis.

It is not found in its native, and separate State, either in the Air or Bowels of the Earth.

It is always found in a compound Form, most frequently in Sulphur or *Pyrites*, Alum, Epsom, Salt, Sea Water, Glauber's Salt, Green Vitriol, Blue Vitriol, White Vitriol.

It is obtained for the Purpose of Art by DISTILLATION from

GREEN VITRIOL.

Or,

By INFLAMMATION from
SULPHUR.

Consult the Table of Elective Attractions for the Order of its Affinity to different Bodies, *viz.*

Columns I. II. III. IV. XVI. XVII. XVIII. XX. XXVII. XXVIII. XXIX. XXX. XXXI. XXXII.

N. B. The volatile Vitriolic Acid is always much diluted, has less Attraction to Alkaline Salts than any of the other Acids, and loses its Volatility and Phlogiston by being exposed to the Air.

N I T R O U S A C I D.

SYNONIMA.

Spiritus Nitri Glauberi.

Smoaking Spirit of Nitre.

Aqua fortis.

Aqua fortis simplex.

Aqua fortis duplex.

Its specific Gravity to Water is as 38 to 24.

It generally exhales Vapours which colour the Air.

It is always fluid, and is much more Volatile than the Vitriolic Acid.

It has a peculiar Taste and Flavour.

It attracts Moisture from the Air, but in much less Quantity than the Vitriolic Acid.

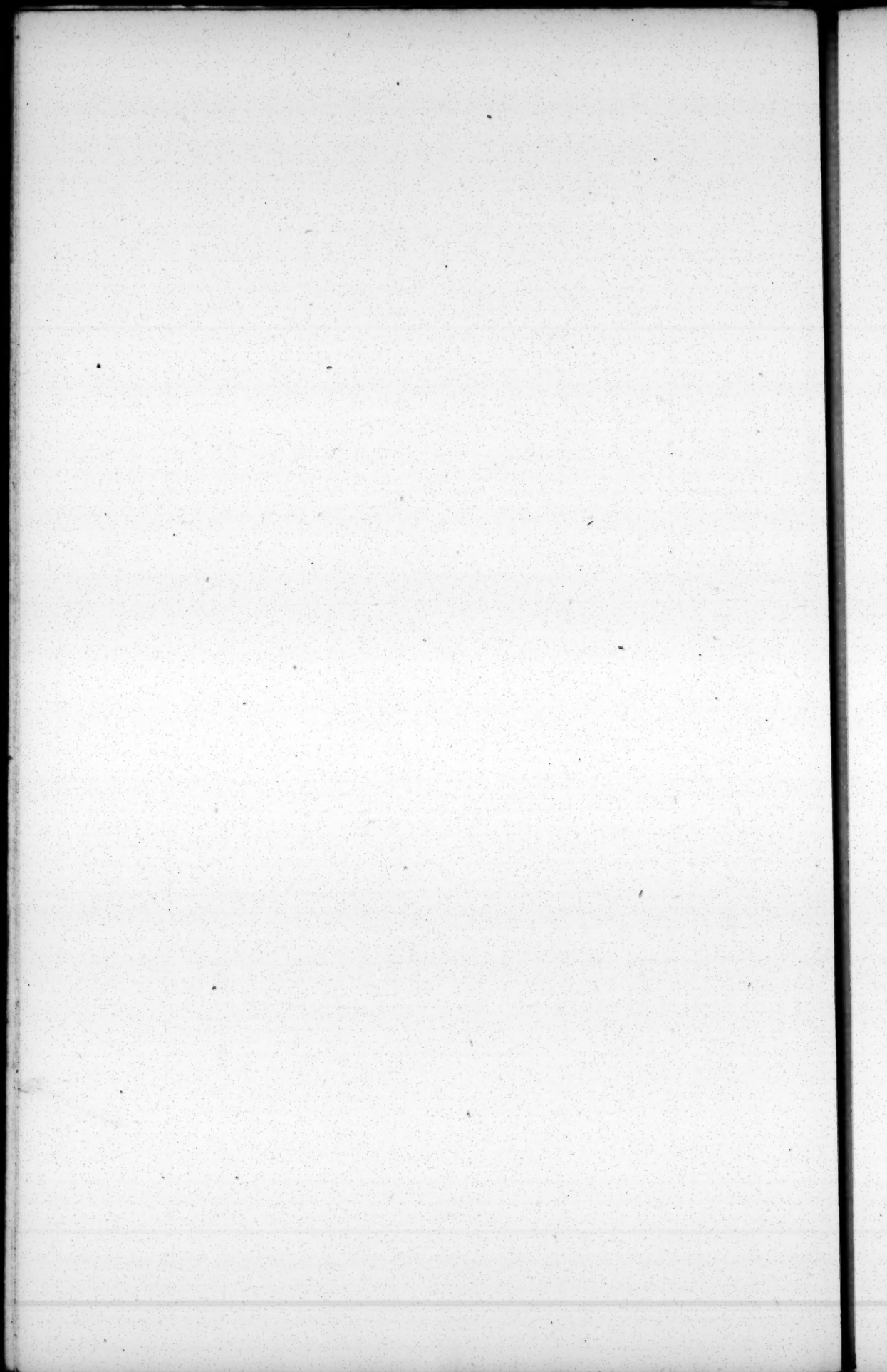
It is the most universal Menstruum for Vegetable and Animal Substances—it tinges the latter of a yellow Colour.

It attracts the Phlogiston more strongly than the Vitriolic Acid, and will separate it from any Body when in the smallest Quantity.—It acts with more Violence on all Bodies with which it unites.

It unites with

I. MURIATIC ACID.

Aqua Regia.



II. FIXED VEGETABLE ALKALI.
Common Nitre.

II. FOSSIL ALKALI.
Cubic Nitre.

IV. VOLATILE ALKALI,
Nitrous Ammoniac.

V. PHLOGISTON.
Smoking Spirit of Nitre.

VI. OILS, generating much Heat and Flame,

VII. ALCOHOL.
Nitrous Æther.
Spiritus Nitri dulcis.

VIII. ZINC.
Nitrum Zinci.

IX. IRON.
Nitrum Ferri.

X. COBALT,
Nitrum Cobalti.

XI. COPPER,
Nitrum Cupri.

XII. BISMUTH.
Sympathetic Ink.
Magistery of Bismuth.

XII. LEAD.
Nitrum Plumbi.

XIV. MERCURY,
Calx Mercurii.
Dr. Ward's White Drop.
Mercurius præcipitatus ruber.
Mercurius corrosivus ruber, P: L:

XV. ANTIMONY,
Bezoardic Mineral.

XVI. SILVER.

Crystals of Silver.
Causticum Lunare.
Lapis Infernalis.

XVII. CALCAREOUS EARTH.

XVIII. MAGNESIA.

XIX. CLAY or EARTH of ALUM.

XX. WATER producing Heat, and a blue or green Colour.

Aqua fortis tenuis.

It is formed by the Putrefaction of Vegetable or Animal Substances, in a State of Combination with Calcareous Earth, or Volatile Alkali.

It is obtained for the Purpose of Art from Common Nitre by Distillation, either by adding the Vitriolic Acid, or Compounds containing that Acid with a Metal, as Green Vitriol, &c.

Its Compounds deflagrate with any inflammable Substance, *i. e.* The inflammable Substance unites with the Acid, and precipitates the Alkali.

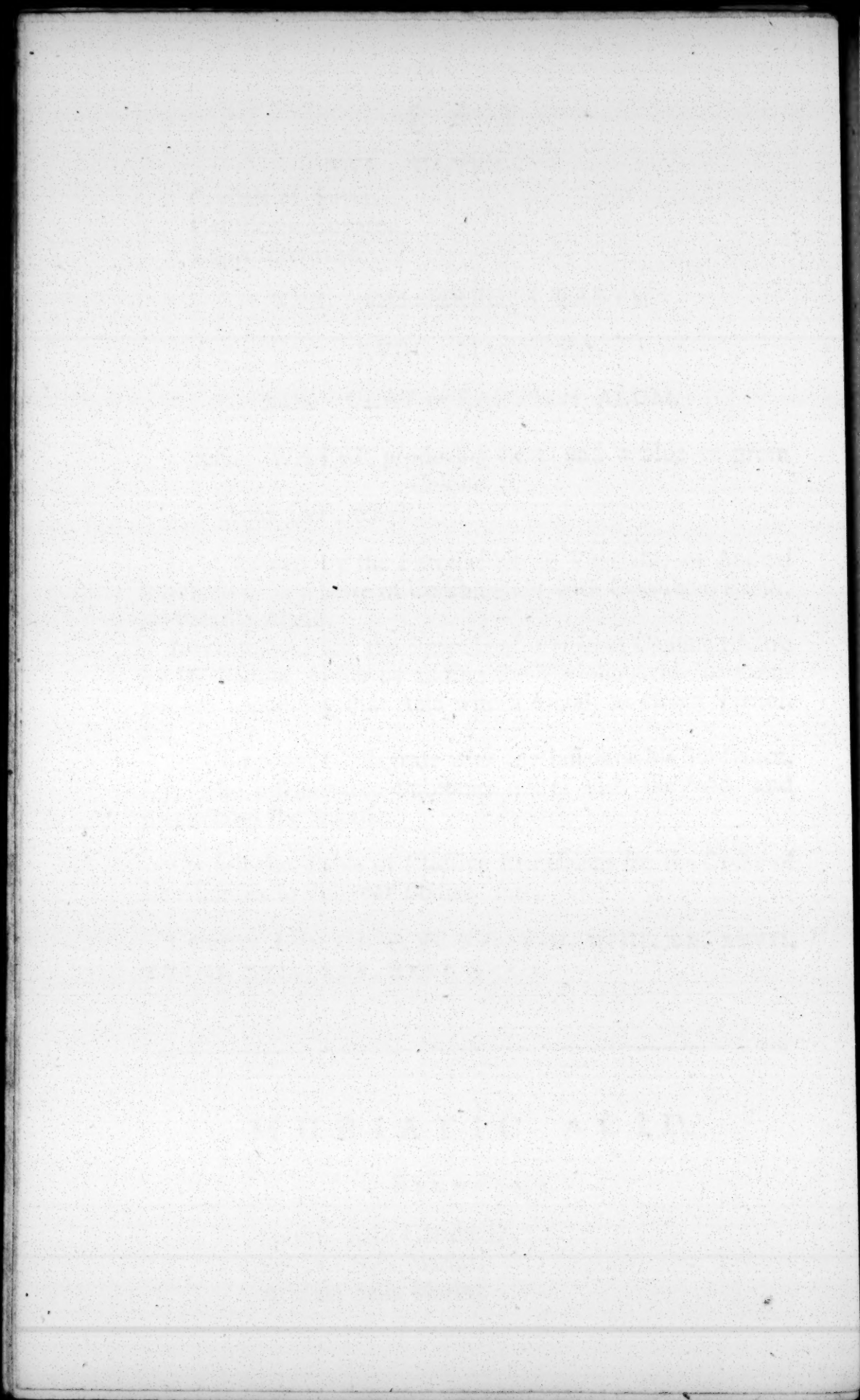
Consult the Table of Elective Attractions for the Order of its Affinities to different Bodies, *viz.*

Columns I. II. III. V. VI. XVI. XVII. XVIII. XX. XXVII, XXVIII. XXIX. XXX. XXXI. XXXII.

MURIATIC ACID,

SYNONIMA.

Spititus Salis Glauberi.
Spiritus Salis Marini.
Acidum Salis Marini.



Marine Acid.

Spirit of Salt.

Its specific Gravity is much less than either the Vitriolic or Nitrous Acid.

It is more volatile than either, and cannot therefore be so perfectly concentrated.

It is of a lighter Colour than the Nitrous, and its Vapours do not tinge the Air.

It attracts Metals more strongly than either the Vitriolic or Nitrous, though it dissolves them with more Difficulty.

It attracts Alkalis and Earths less.

It is with Difficulty united with Phlogiston.

It unites with Nitrous Acid, forming Aqua Regia, which is a Menstruum of Gold, Platina, and other Metals.

It unites with

I. NITROUS ACID.

Aqua Regia.

II. FIXED VEGETABLE ALKALI.

Digestive Salt of Sylvius.

III. FOSSIL ALKALI.

Common Salt.

IV. VOLATILE ALKALI.

Sal Ammoniac : crudum.

V. OILS with little Heat.

VI. ALCOHOL.

Muriatic Æther.

Spiritus Salis Dulcis.

VII. ZINC.

Muria Zinci.

VIII. IRON.

Muria Ferri.

Tinct. Martis in Spiritu Salis.

IX. TIN.

• Sal Jovis.

X. ANTIMONY.

Causticum Antimoniale.

Butter of Antimony.

XI. COPPER.

Muria Cupri.

XII. LEAD.

Plumbum corneum.

XIII. SILVER.

Luna Cornea.

XIV. MERCURY.

Corrosive Sublimate.

XV. CALCAREOUS EARTH.

Fixed Ammoniac.

Liquid Shell.

XVI. MAGNESIA.

XVII. CLAY, or EARTH of ALUM.

XVIII. WATER, with little Heat,
produces Cold with Snow.

It is never found pure in its separate State.

It is generally found united with the Fossil Alkali in SEA WATER, or in SAL GEM.

It is united with Volatile Alkali in crude Sal Ammoniac.

It is united frequently with Magnesia in Sea Water, and in some salt Springs.

It is separated from Common Salt by Distillation, either by Vitriolic or Nitrous Acids.

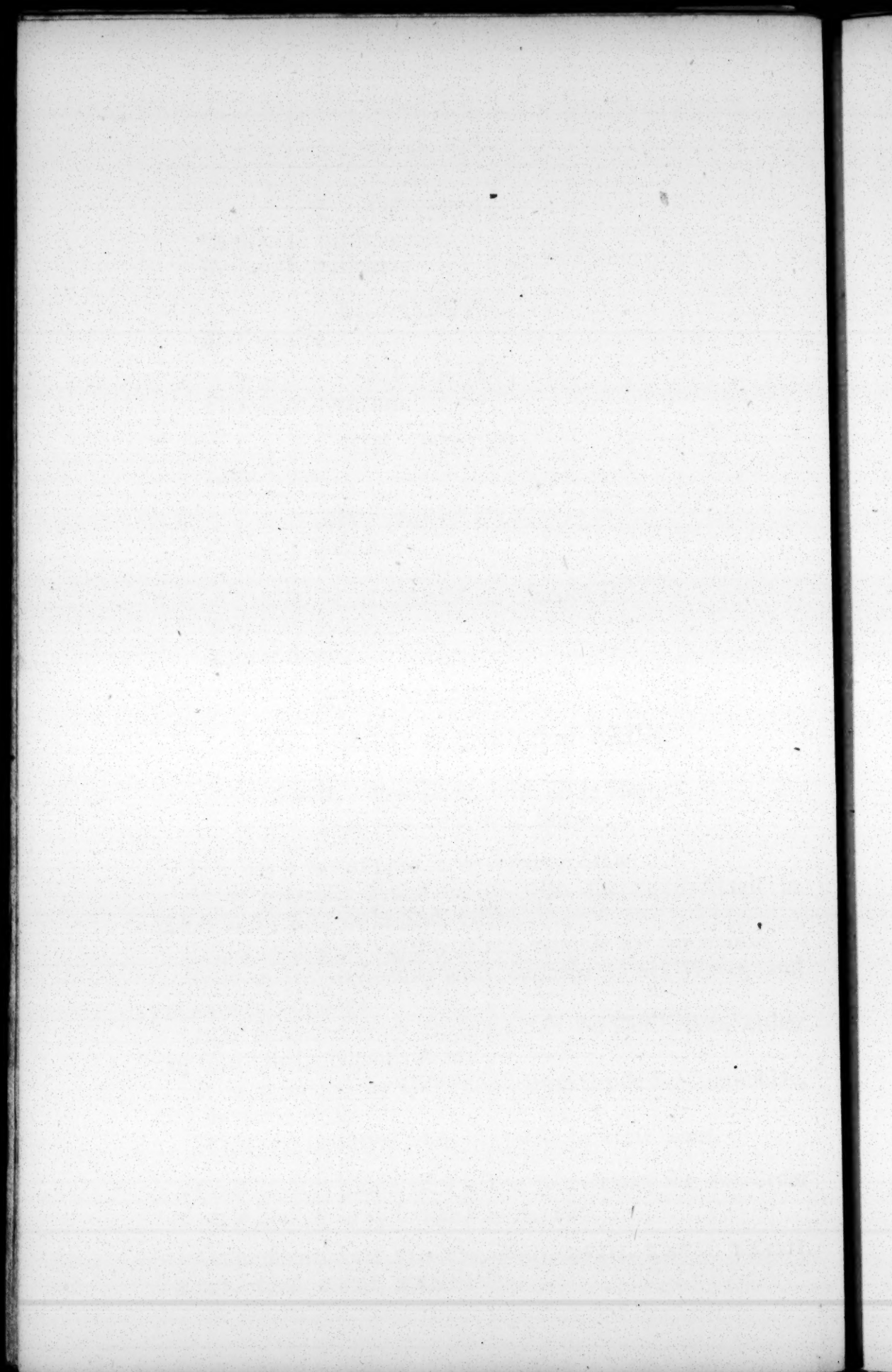
It is separated by Distillation from Crude Sal Ammoniac, by the same Acids.

It may be separated from Magnesia by Heat alone.

Consult the Table of Elective Attractions for the Order of its Affinities to different Bodies, viz.

Columns I. II. III. VII. XVI. XVII. XVIII. XXVII. XXVIII.
XXIX. XXX. XXXI. XXXII.

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V I N E G A R.

SYNONIMA.

Acetum.
Acetum distillatum.
Acetous Acid.
Radical Vinegar.
Spiritus Veneris.

It is more dilute, and of less specific Gravity than either the Vitriolic, Nitrous, or Muriatic Acids.

It is less Volatile than Water.

It has less Attraction to Alkalis, Phlogiston, Metals, or Earths, than the Vitriolic, Nitrous, or Muriatic Acids.

It is too dilute to attract Moisture from the Air.

It unites with

I. FIXED VEGETABLE ALKALI.

Sal Diureticus.

II. FOSSIL ALKALI.

III. VOLATILE ALKALI.

Spiritus Mindireri.
Vegetable Ammoniac.

IV. ALCOHOL.

Vegetable Æther.
Spiritus Aceti dulcis.

V. ZINC.

Acetum Zinci.

VI. IRON.

Acetum Ferri.

VII. COPPER.

Verdegrees.

VIII. LEAD.

Cerusse.

Sugar of Lead.

IX. MERCURY.

Keiser's Pills.

X. SILVER.

Vegetable Salt of Silver.

XI. CALCAREOUS EARTH.

Vegetable Salt of Chalk.

Salt of Coral.

XII. MAGNESIA.

XIII. CLAY or EARTH of ALUM.

XIV. WATER without producing Heat.

It is obtained by the second Stage of Fermentation in Vegetables, after the Formation of Wine.

The acetous Fermentation is assisted by Heat and Agitation.

It may be concentrated either by Distillation, or Congelation.

It may likewise be concentrated by separating it from any Neutral, Metallic, or Earthy Salt.

For this Purpose we chiefly employ the Sal Diureticus, or the Chrystals of Copper in a dry Form, and either by Heat alone or the Addition of concentrated Vitriolic Acid we obtain by Distillation the Acid of Vinegar.

Consult the Table of Elective Attractions for the Order of its Affinity to other Bodies, viz.

Columns I. II. III. VIII. XVI. XVII. XVIII. XXVII. XXVIII.

ACID of TARTAR.

SYNONIMA.

Red Tartar.
Wine Stone.
White Tartar.
Cream of Tartar.
Chrystals of Tartar.
Essential Salt of Wine.

It is an acid oily vegetable Concrete, deposited by Wines, after they have gone through their Stage of Fermentation.

It is a weak Acid, very difficultly soluble in cold Water. An Ounce of distilled Water in the Heat of 50 Degrees will only dissolve three Grains of it.

By Calcination in the Fire, and even in the Residuum of its Distillation, it yields a large Quantity of pure Alkaline Salt.

This was formerly supposed to arise from the Operation of the Fire, as in other vegetable Substances; but it appears from some late Experiments, that the Alkali pre-existed in the Tartar, and that it may be separated by other Means.

Therefore this Acid Concrete may probably be considered with more Propriety as a Neutral Salt with a superabundant Quantity of Acid.

It unites with

I. FIXED VEGETABLE ALKALI.

Soluble Tartar.

Tartarum Tartarizatum.

II. FOSSIL ALKALI.

Sel de Saignette.

Sel Polychreste de la Rochelle.

III. VOLATILE ALKALI.

It does not unite with Oils, Sulphur, or Spirits of Wine.

IV. IRON.

Chalibeated Tartar.

Tinctura Martis tartarizata.

V. COPPER.

Cuprum Tartarizatum.

VI. ANTIMONY.

Tartarum Emeticum.

VII. MERCURY.

Mercurius Tartarizatus.

VIII. CALCAREOUS EARTH.

IX. MAGNESIA.

The Rhenish and Moselle Wines deposit a great deal of Tartar, though for the Purpose of Arts and Manufactures it is chiefly obtained from the Raisin Wine.

It is impregnated with the Colour of the Wine.

It is purified and rendered white by repeated Solution in Water, and is afterwards filtrated through a pure Clay.

Its most perfect Chrystals are obtained by cooling.

It has less Attraction to Alkaline Salts than Vinegar. In the Table of Attractions it should stand immediately under Vinegar.

The Neutral Salts which are formed by it, are very soluble in Water, and easily chrySTALLIZE if there be a superabundant Proportion of Alkali in the Solution.

SAL SEDATIVUM HOMBERGII.

SYNONIMA.

Sal Narcoticum Hombergii.

Acidum Boracis.

Flores Boracis.

Sal Volatile Narcoticum.

Sal album Alchymistarum.

This is a saline chrystalline Body, which is separated from Borax by the Interposition of other Acids.

It has not the Sourness of an Acid, nor does it change the Colour of vegetable Blues—It has therefore only in Part the Properties of an Acid.

It is very difficultly soluble in cold Water. It may be dissolved in a much greater Quantity in boiling Water, therefore its Chrystals are best obtained by cooling.

It is a very fixed Salt, and may be melted into a vitrified Mass.

Its Combination with the FOSSIL ALKALI in the State of Borax has been hitherto the only Subject of Experiment.

It dissolves in Spirits of Wine, and the Solution in burning gives out a beautiful Green Flame.

It is obtained only from Borax by ChrySTALLIZATION, or Sublimation.—*Vide Macquer's Chymistry.*

Its Volatility in the Form of a Sublimate depends upon the Water in its Chrystals.

FIXED VEGETABLE ALKALI.

SYNONIMA.

Combined with Air.

Sal Absinthii.

Sal Tartari.

Nitrum fixum.

Cineres Clavellati.

Oleum Tartari per Deliquium.

Lixivium Tartari.

Pot-Ash.

Pearl-Ash.

Free from Air.

Caustic Fixed Vegetable Alkali:

Soap Lees.

Lapis Septicus.

Cauterium Potentiale.

Causticum Commune fortius.

Causticum Commune mitius.

It has all the general Properties of an Alkaline Salt.

It attracts Moisture from the Air.

It produces Heat with Water.

It is very soluble in Water.

It effervesces with an Acid when it contains Air, and is then called a *mild Alkali*; when it is deprived of its Air it does not effervesce with Acids, and it is then called a *Caustic Alkali*.

The mild and caustic Alkalis make the same Neutrals with Acids.

A Caustic Alkali has more Power in dissolving Animal and Vegetable Substances than a Mild Alkali; and is therefore preferred for the Purpose of dissolving the Stone, and other Uses.

It unites with

I. VITRIOLIC ACID.

Vitriolated Tartar.

II. NITROUS ACID.

Nitre.

III. MURIATIC ACID.

Spiritus Marini coagulatus P: L:

Digestive Salt of Sylvius.

IV. VINEGAR.

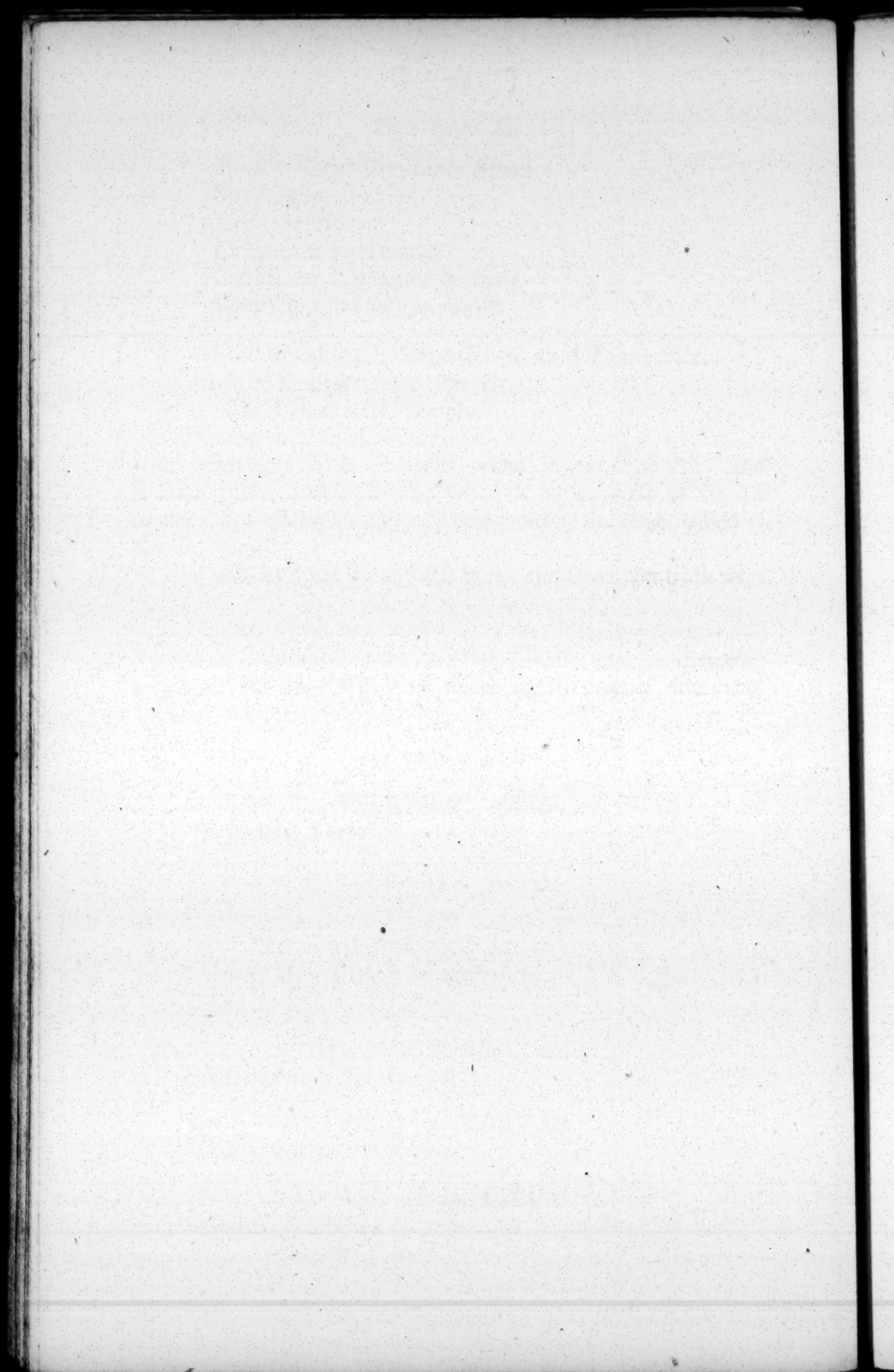
Sal Diureticus Ph: L:

V. ACID of TARTAR.

Soluble Tartar.

VI. SAL SEDATIVUM.

Borax V. stabilis.



VII. OILS, more readily when caustic.
Soap.

VIII. SULPHUR.
Hepar Sulphuris.

IX. ALCOHOL.
Spiritus Vini Alkalizatus.

X. PHLOGISTON.
Alkali for Prussian Blue.
Black Flux.

XI. IRON.
Tinctura Martis Alkalina.

XII. COPPER.
Tinctura Cupri Alkalizata.

It redissolves the Precipitates of most other Metals, when the Acid which has dissolved them is concentrated, and not nearly saturated with the Metal.

The Solutions of Metals in this Alkali is seldom clear, and they deposit upon standing.

XIII. CHRYSTALLINE EARTH, by Fusion.
Glaſs.

XIV. CALCAREOUS EARTH, by Fusion.
Glaſs.

XV. CLAY; by Fusion.
Glaſs.

XVI. WATER and AIR.
Oleum Tartari per deliquium.

XVII. WATER without AIR.
Soap Lees.

XVIII. FIXED AIR.
Mild Alkali.

The Fixed Alkali, when saturated with Fixed Air, may be made to chryſtallize.

It is the most deliquescent when deprived of Air.

It is deprived of Air by the Addition of Quick-Lime.

It recovers its Air either by its being transferred into it from an effervescent Mixture, by the Addition of Magnesia, or Volatile Alkali, or by exposing it long to the common Air.

It is procured by the Calcination of Vegetable Substances, from their Ashes. By the Calcination of Tartar, and by the Deflagration of Nitre.

It is never perfectly pure when obtained from the Ashes of Plants.

It is in the purest State when obtained by Deflagration from Nitre.

Its Evaporation to Dryness, or ChrySTALLIZATION, should be done in Silver Vessels.

For many Purposes in Arts and Manufactures it is calcined, to render it whiter, and give it more Causticity.

The Fixed Vegetable Alkali, when perfectly pure, is the same Substance from whatsoever Body it is prepared.

For its Relation to other Bodies consult the Tables of its Affinities, viz.

Columns I. II. IV. V. VI. VII. XVI. XVII. XIX. XX. XXIII. XXIV. XXV.

Does it attract Acids more strongly than the FOSSIL ALKALI ?

FOSSIL ALKALI.

SYNONIMA.

Alkali Minerale.
Terra Salis Marini.
Natrum.
Nitrum Veterum.
Nitrum Ægyptiacum.
Soda et Barilla Hispan.
Kelp. Angl.

This Alkali has many Properties in common with the Vegetable Alkali, though it differs essentially in others.

Its Mildness, or Causticity, like the other, depends upon the Presence or Absence of Air. It is less Caustic than the Vegetable Alkali even when deprived of Air.

It does not attract Moisture from the Air.

It is easily chrystallized, and its Chrystals become dry and lose their Water when exposed to the Air.

It is more difficultly dissolved in Water than the Vegetable Alkali.

It forms Neutral Salts with Acids, different from those formed by the Vegetable Alkali.

They are in general more soluble in Water, and have more stimulating Powers.

It unites with

I. VITRIOLIC ACID.

Glauber's Salt.

II. NITROUS ACID.

Cubic Nitre.

III. MURIATIC ACID.

Common Salt.

IV. VINEGAR.

V. ACID of TARTAR.

Sel de la Rochelle.

VI. OIL when caustic.

Soap.

VII. SULPHUR.

Hepar Sulphuris.

Sulphureous Mineral Waters.

VIII. ALCOHOL.

Spiritus Vini Alkalinus.

IX. IRON.

Tinctura Martis Alkalina.

C

X. COPPER.

X. COPPER.

Tinctura Cupri Alkalina.

It has the same Power of redissolving the Precipitates of Metals, as the Vegetable Alkali.

XI. CRYSTALLINE EARTH, by Fusion.
Glas.

XII. CLAY, by Fusion.
Glas.

XIII. CALCAREOUS EARTHS, by Fusion.
Glas.

XIV. WATER.

XV. FIXED AIR.
Mild Fossil Alkali.

It is frequently found native in its separate State.

It is obtained by the Calcination of such Vegetables as contain Sea Salt.

It may be separated from the Muriatic Acid in Sea Salt, either by the Vitriolic or Nitrous Acids; in the last Case there is formed a Cubic Nitre, from which the Fossil Alkali may be separated by the Phlogiston.—The Muriatic Acid of Sea Salt cannot be separated by Phlogiston.

It is in the Ashes of Sea Plants with a great deal of common Salt, from which it can only be separated by Solution and Evaporation.

The purest Kind is that which is separated from Cubic Nitre.

Soaps formed by the Fossil Alkali have more Firmness than those of the Vegetable Alkali.

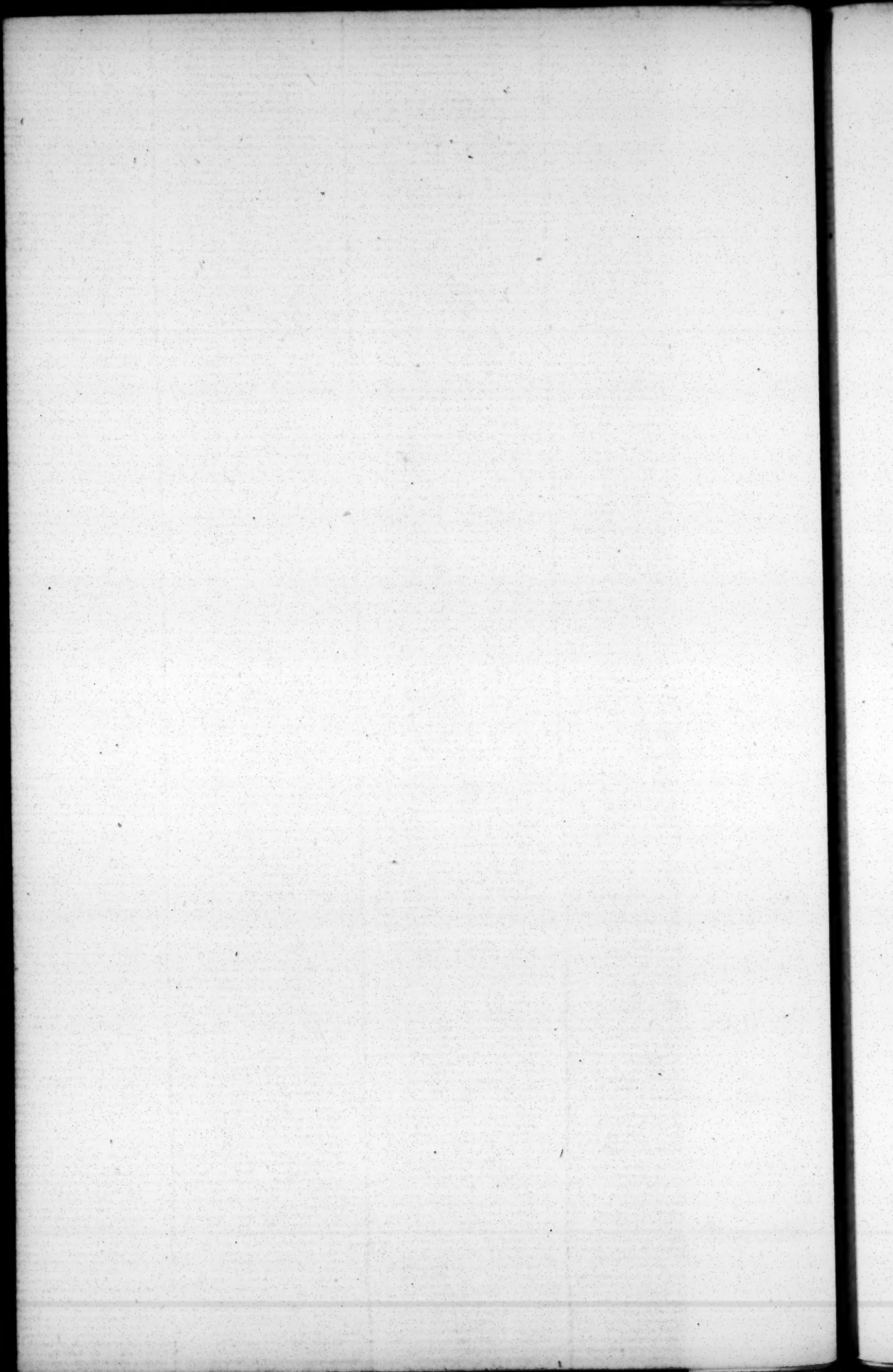
Glas made of the Fossil has more Hardness than Glas of the Vegetable Alkali.

For the Degree of its Affinity to different Bodies consult the Table of Elective Attractions, viz.

Columns I. II. IV. V. VI. VII. IX. XVI. XVII. XIX.
XX. XXIII. XXIV. XXV.

Has it less Attraction to the Acids than the Vegetable Alkali?

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VOLATILE ALKALI.

SYNONIMA.

With Air.

Spiritus Salis Ammoniaci.
Spiritus Cornu Cervi. .
Spiritus Fuliginis.
Sal Volatilis Ammoniaci.
Sal Cornu Cervi.

Without Air.

Caustic Volatile Alkali.
Spiritus Salis Ammoniaci cum Calce Vivâ.

It has all the general Properties of an Alkali, *viz.* Acrimony and Causticity, changes vegetable Blues to a green Colour, saturates Acids, and with them constitutes Neutral Salts, which are capable of ChrySTALLIZATION.

It decomposes Earthy and Metallic Salts.

It is rendered Caustic by Quick-Lime, in which State it is always fluid, and does not effervesce with Acids.

It is said to be Volatile, because it has a pungent Odour, and is entirely dissipated by a small Degree of Heat.

When perfectly pure it is the same Substance from whatsoever Body it is obtained.

In the State of Spirit of Hartshorn it has an animal Oil adhering to it, which gives it a peculiar Flavour.

It is in its mildest State in a solid Form.

It has less Attraction to Acids than either of the Fixed Alkalis, so they decompose all the Ammoniacal Salts.

It unites with

I. VITRIOLIC ACID,
Vitriolic Ammoniac.

II. NITROUS ACID.

Nitrous Ammoniac.

III. MURIATIC ACID.

Common Ammoniac.

IV. VEGETABLE ACID,

Vegetable Ammoniac.

Spiritus Mindereri.

V. OIL.

Spiritus Volatilis Aromaticus.

Eau de Lucé.

VI. SULPHUR.

Volatile Tincture of Sulphur.

VII. ALCOHOL.

Spiritus Volatilis Dulcis.

VIII. COPPER.

It redissolves the Precipitate of most Metals from Acids, if the Acid be not saturated with the Metal.

It precipitates Gold from Aqua Regia in the Form of *Aurum Fulminans*.

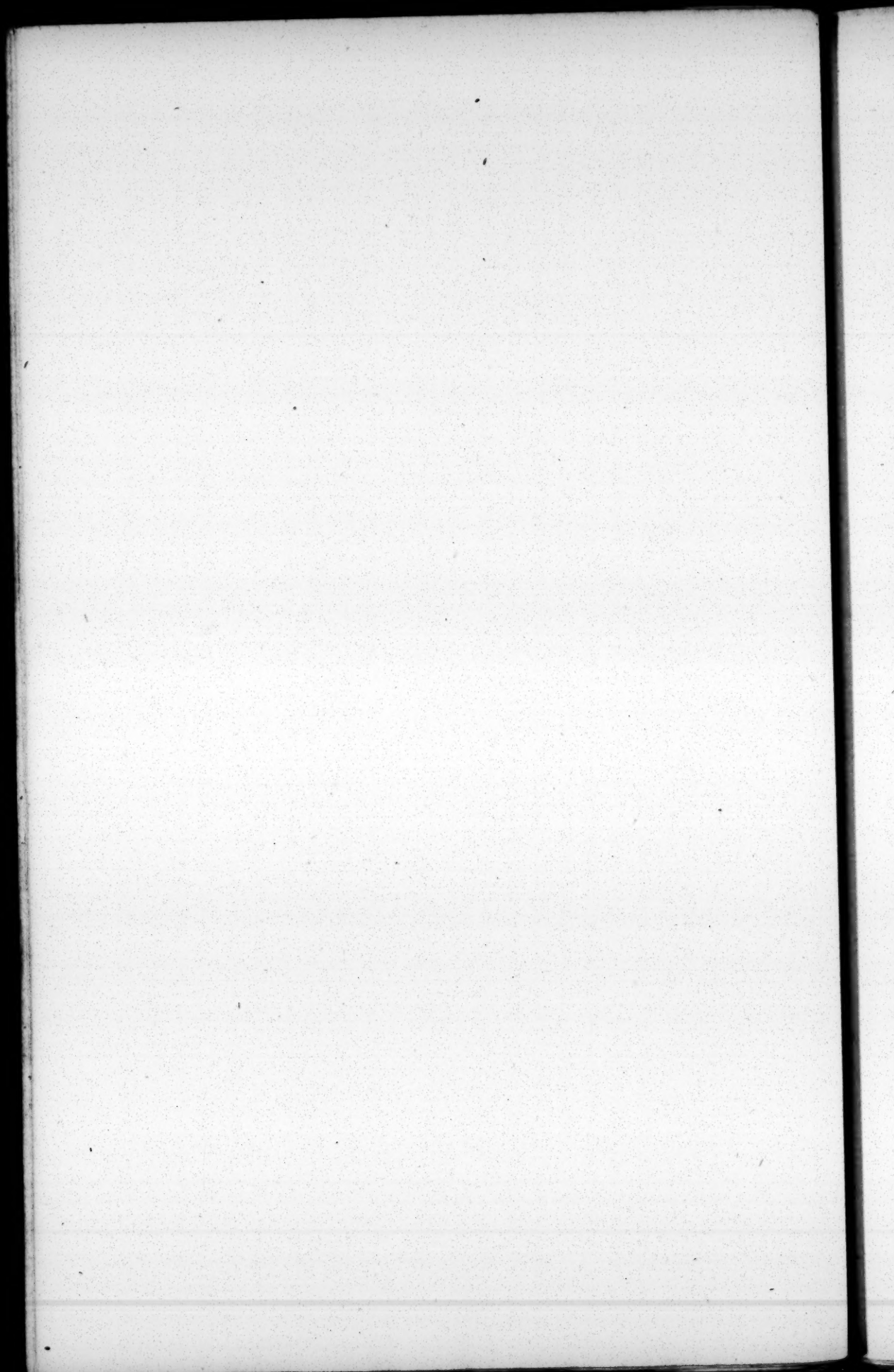
Copper communicates a blue Colour to the Volatile Alkali, which it loses when shut up from the Air, but it recovers it again when exposed to the Air.

It is obtained by Distillation from animal Substances, and from some Vegetable, especially during their Putrefaction.

It is obtained from Common Ammoniac by the Addition of Chalk, Salt of Tartar, or Quick-Lime. By the two first it is got in a mild and effervescent Form; by the last, in a caustic and non-effervescent State.

Consult the Table of Elective Attractions for its Relation to other Bodies, *viz.*

Columns I. II. III. IV. V. VI. VII. XVI. XVII. XIX, XXII. XXV. XXVI.



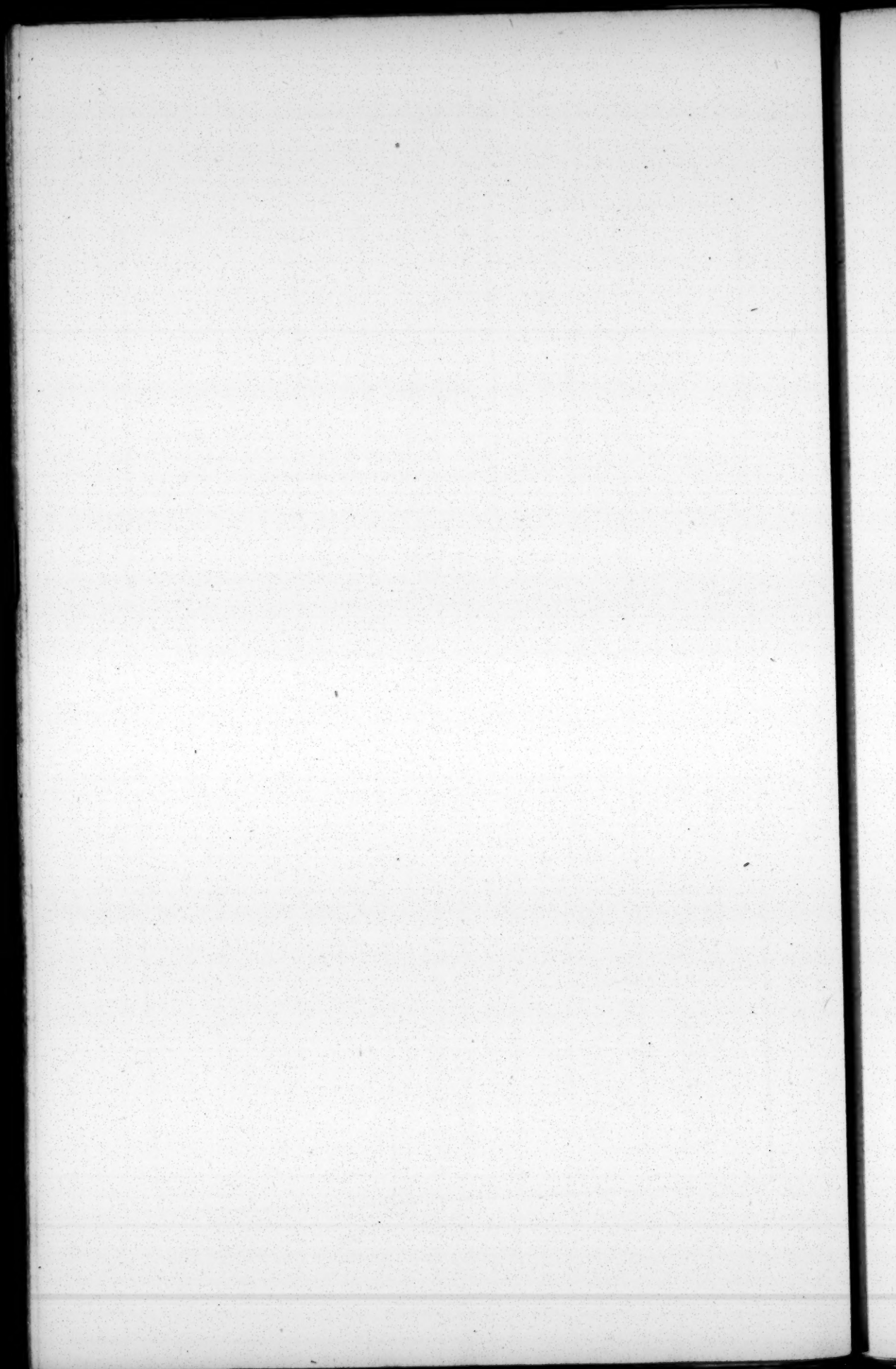
O F
N E U T R A L S A L T S.

When an Acid and Alkali are united together in that Proportion by which they are mutually saturated, they form a Compound Salt, which has been called a Neutral Salt; because the separate Properties of each constituent Part seem destroyed in the Compound, and thereby a *tertium quid* formed.

The following Table expresses the Number of Neutral Salts, together with the Acids and Alkalís which compose them.

A TABLE of NEUTRAL SALTS.

	VITRIOLIC ACID.	NITROUS ACID.	MURIATIC ACID.	ACETOUS ACID.	TARTAR.	SEDATIVE ACID.
VEGETABLE ALKALI.	Viriolated Tartar.	Common Nitre.	Digestive Salt.	Regenerated Tartar.	Soluble Tartar.	
FOSSIL ALKALI.	Glauber Salt.	Cubic Nitre.	Common Salt.		Salt of Rochelle.	Borax.
VOLATILE ALKALI.	Vitriolic Ammoniac.	Nitrous Ammoniac.	Common Ammoniac.	Vegetable Ammoniac.		



A Neutral Salt may be prepared in Four different Ways;

1. By adding the Acid and Alkali together, each being in their separate State, e. g. Salt of Tartar added to Vitriolic Acid makes Vitriolated Tartar.

2. By adding the Acid in its separate State to Compounds containing the Alkali, the Acid separating one of the constituent Parts of the Compound, while it unites with the Alkali, e. g. Vitriolic Acid added to Nitre, will produce Vitriolated Tartar.

3. By adding the Alkali to Compounds which contain the Acid, the Alkali separating one of the constituent Parts of the Compound, while it unites with the Acid, e. g. Salt of Tartar added to Green Vitriol, will produce Vitriolated Tartar.

4. By adding two compound Bodies together, the constituent Parts of which, by a mutual change of Situation, produce the Neutral Salt proposed, e. g. Vitriolic Ammoniac added to Nitre, will produce Vitriolated Tartar.

The Second and Third is by single Elective Attraction ; the Fourth is by double Elective Attraction.

All Neutral Salts may be decomposed either by Single or Double Elective Attraction.

The following Tables shew the different Methods of Composition and Decomposition of all the Neutral Salts, by Single and Double Elective Attraction.

TARTARUS VITRIOLATUS.

COMPOSITION
by Single
Elect. Attraction.

Ac. Vitri.

Nitrum
Sal Digestivus
Tartarus Regeneratus
—— Tartarificatus
Borax Vegetabilis
Sapo Communis
Hepar Sulphuris Veg.
Ammoniacus Vitriolicus
Vitriol. Alb. Cerul. Virid.
Alumen
Selenites
Mag. Glaub. Sal
Sulphur and its Ores.

Alk. Fix.
Vegetab.

By Double Elect. Attraction.

Alk. Volat. × Alk. Fix. Veg. | Alk. Volat. × Alk. Fix. Veg.
Ac. Vitriol. × Ac. Nitros. | Ac. Vitriol. × Ac. Muriat.

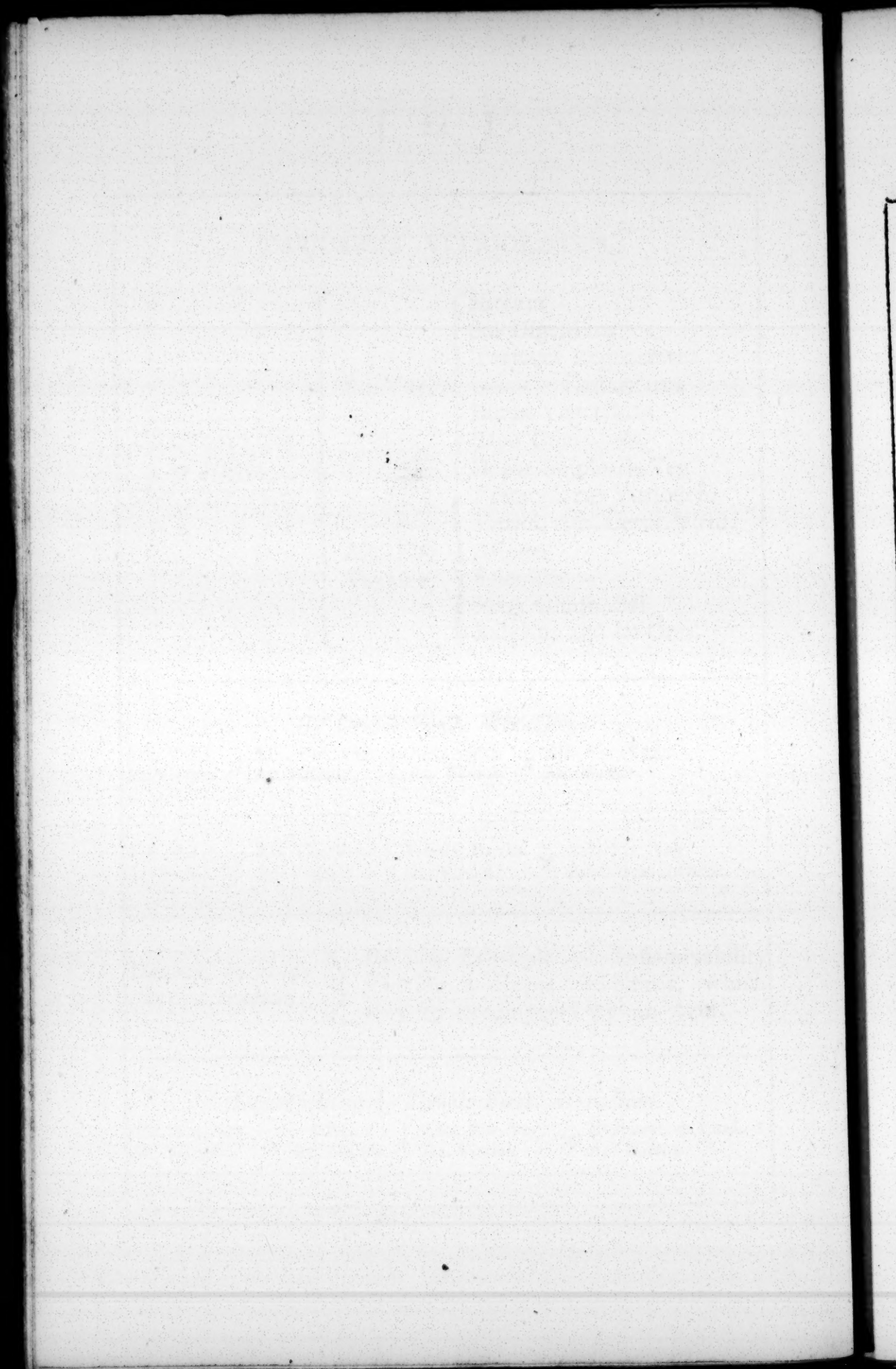
Alk. Volat. × Alk. Fix. Veg. | Metals, Earths. × Alk. Fix. Veg.
Ac. Vitriol. × Ac. Vegetab. | Ac. Vitriol. × Ac. Nitros. Muriat. &c.

*Decomp. by Sing.
Elect. Attraction.*

} By the Principle of Inflammability
forming a Hepar Sulphuris, which
may be decomposed by an Acid.

Decomposition by Double Elect. Attraction.

Alk. Fix. Veg. × Silver. | Alk. Fix. Veg. × Mercury, or Lead.
Ac. Vitriol. × Ac. Nitros. | Ac. Vitriol. × Ac. Nitros.



SAL GLAUBERI.

<i>Comp. by Sing. Elect. Attraction.</i>	Ac. Vit.	Nitrum Cubicum Sal Commune Polychrest de Rochelle Sel de Saignette Borax Sapo Hispan. Hepar Sulphuris Fossil. Ammoniacus Vitriolicus Vitriol. Alb. Cerul. Virid.
	Alk. Fix. Fossil.	Alumen Selenites Magn. Glaub. Sal Sulphur and Ores.

By Double Elect. Attraction.

Alk. Volat. X	Alk. Fix. Fossile	Alk. Volat. X	Alk. Fix. Fossile
Ac. Vitriol.	Ac. Nitros.	Ac. Vitriol.	Ac. Muriat.

Alk. Volat. X	Alk. Fix. Fossile.	Metals, Earths X	Alk. Fix. Fossile
Ac. Vitriol.	Sal Sedavitus	Ac. Vitriol.	Ac. Muriat.

Decomposition.—The same with Vitriolated Tartar.

By Double Elect. Attraction.

N I T R U M.

<i>Comp. by Sing. Elect. Attraction.</i>	{	Ac. Nitr.	{	Sal Digestivus
				Tartarus Regeneratus
				—— Tartarifatus
				Borax Vegetabilis
				Sapo Communis
				Hepar Sulphuris Veg.
		Alk. Fix.	{	Ammon. Nitros.
		Vegetab.	{	Metallic and Earthy Salts.

By Double Elect. Attraction.

Alk. Volat.	×	Alk. Fix. Veg.		Alk. Volat.	×	Alk. Fix. Vegetab.
Ac Nitros.		Ac Muriat.		Ac. Nitros.		Ac. Vegetab.

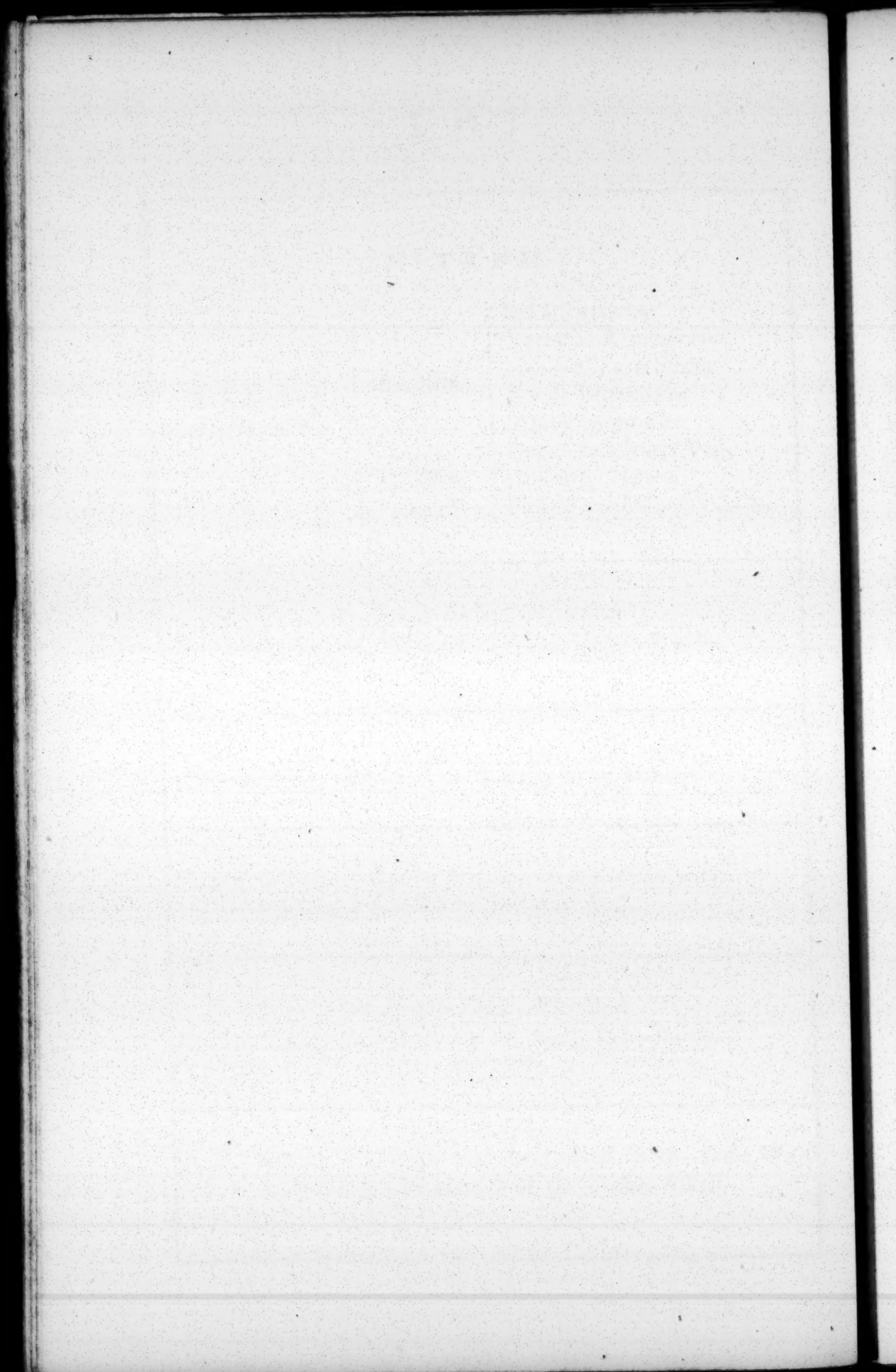
Alk. Volat.	×	Alk. Fix. Veg.		Metals, Earths	×	Alk. Fix. Veg.
Ac. Nitros.		Sal. Sedativus.		Ac. Nitros.		Ac. Muriat.

Decomp. by Sing. { *By the principle of Inflammability*
Elect. Attraction. { *And by the Vitriolic Acid.*

By Double Elect. Attraction.

Alk. Fix. Veg.	×	Alk. Volat.		Alk. Fix. Veg.	×	Metals, Earths.
Ac. Nitros.		Ac. Vitriol.		Ac. Nitros.		Vitriol. Ac.

N. B. Nitrum Cubicum may be treated in the same Way,
only using Compounds of the Fossile Alkali.



SAL COMMUNE.

<i>Comp. by Single Elect. Attraction.</i>	Ac. Muriat.	{ Polychrest de Rochelle Sel de Saignette. Borax Sapo Hispan. Hepar Sulphuris Fossil.
	Alk. Fix. Fossil.	{ Ammon. Commun. Metallic Salts Earthy Salts.

By Double Elect. Attraction.

Alk. Volat.	×	Alk. Fix. Fossil		Alk. Volat.	×	Alk. Fix. Fossil
Ac. Muriat.		Ac. Vegetab.		Ac. Muriat.		Sal Sedativus.

Decomp. by Sing. Elect. Attraction. { By the Principle of Inflammability
And by the Acids of Vitriol and Nitre.

By Double Elect. Attraction:

Alk. Fix. Fossil	×	Alk. Volat.		Alk. Fix. Fossil	×	Alk. Volat.
Ac. Muriat.		Ac. Vitriol.		Ac. Muriat.		Ac. Nitros.

N. B. Sal Digestivus may be treated the same Way by using
Compounds of the Vegetable Alkali.

TARTARUS REGENERATUS.

<i>Comp. by Single Elect. Attraction.</i>	{	Ac. Veg.	{	Tartarus Tartarifatus
				Borax Vegetabilis
				Sapo Communis
				Hepar Sulphuris Veg.
		Alk. Fix.		Ammon. Vegetabilis
		Vegetab.		Metallic and Earthy Salts.

By Double Elect. Attraction.

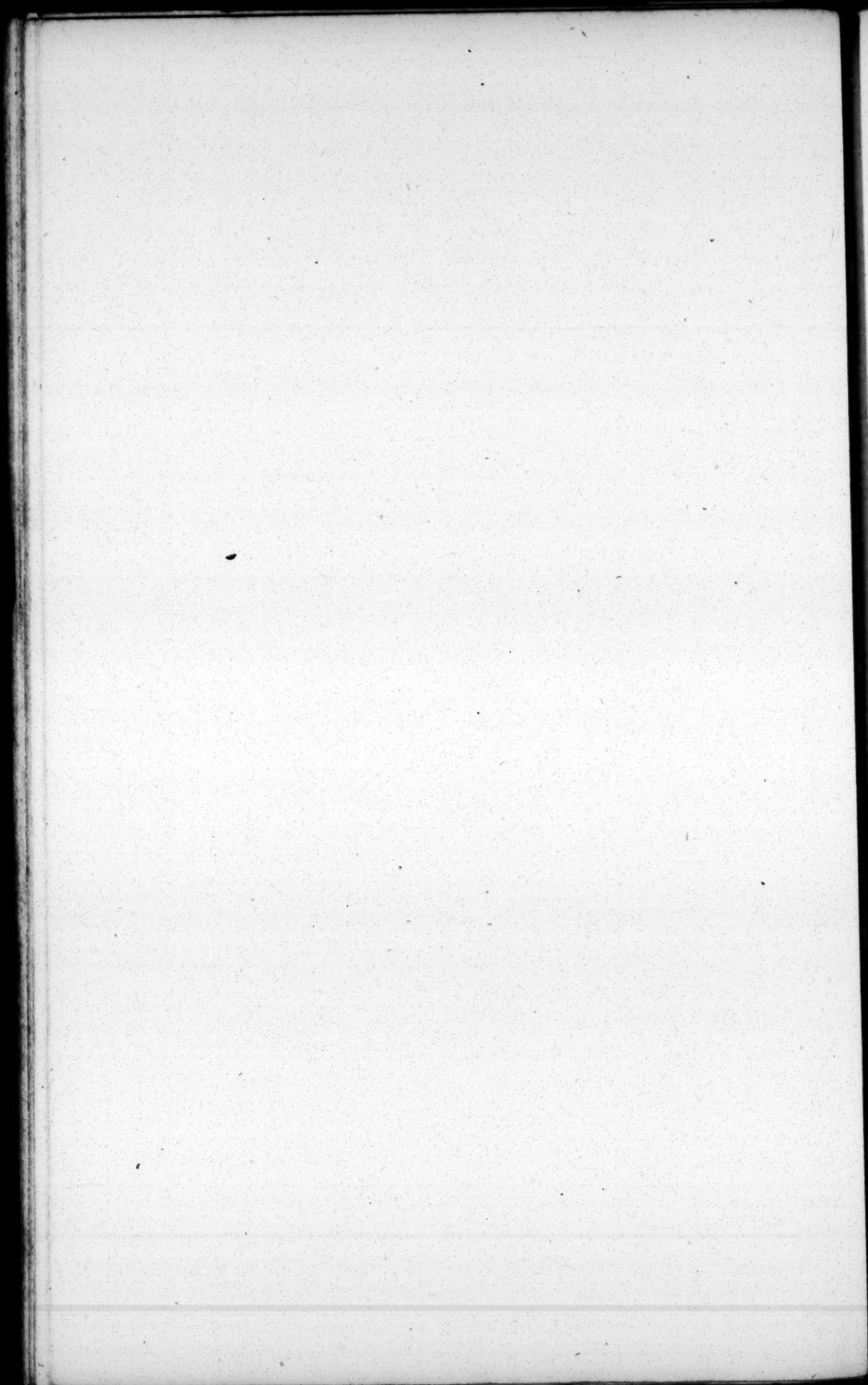
Alk. Volat	×	Alk. Fix. Veg.		Alk. Volat.	×	Alk. Fix. Veg.
Ac. Vegetab.		Tartar.		Ac. Aceti.		Sal Sedativus

Decomp. by Sing. { By Fire alone
Elect. Attract. { By the Vitriolic, Nitr. and Muriat. Acids.

By Double Elect. Attraction.

Alk. Fix. Veg.	×	Alk. Volat.		Alk. Fix. Veg.	×	Alk. Volat.
Ac. Aceti.		Ac. Vitriol.		Ac. Aceti		Ac. Vitr. Nitros.

N. B. Polychrest de Rochelle may be treated the same Way,
 but the Compounds must be of the Fossil Alkali.



SEL DE SAIGNETTE.

<i>Comp. by Single Elect. Attraction.</i>	{	Tartar	{ Borax
			{ Sapo Hispan.
			{ Hepar Sulphuris Fossile
	{	Alk. Fix.	{ Ammon. Tartarificatus
		Fossile	{ Metallic and Earthy Salts.

By Double Elect. Attraction.

Alk. Volat.	X	Alk. Fix. Fossile
Tartar.		Sal Sedavitus.

Decomp. by Sing. { By Fire alone.
Elect. Attraction. { By the Vitriolic, Nitrous, Muriatic, and
Acetous Acids.

By Double Elect. Attraction.

Alk. Fix. Fossile.	×	Alk. Volat.		Alk. Fix. Fossile	×	Alk. Volat.
Ac. Tartar.		Ac. Vitriol.		Ac. Tartar.		Ac. Nitros, &c.

N. B. Tartarus Tartarifatus may be composd and decomposd in the same Manner.

B O R A X.

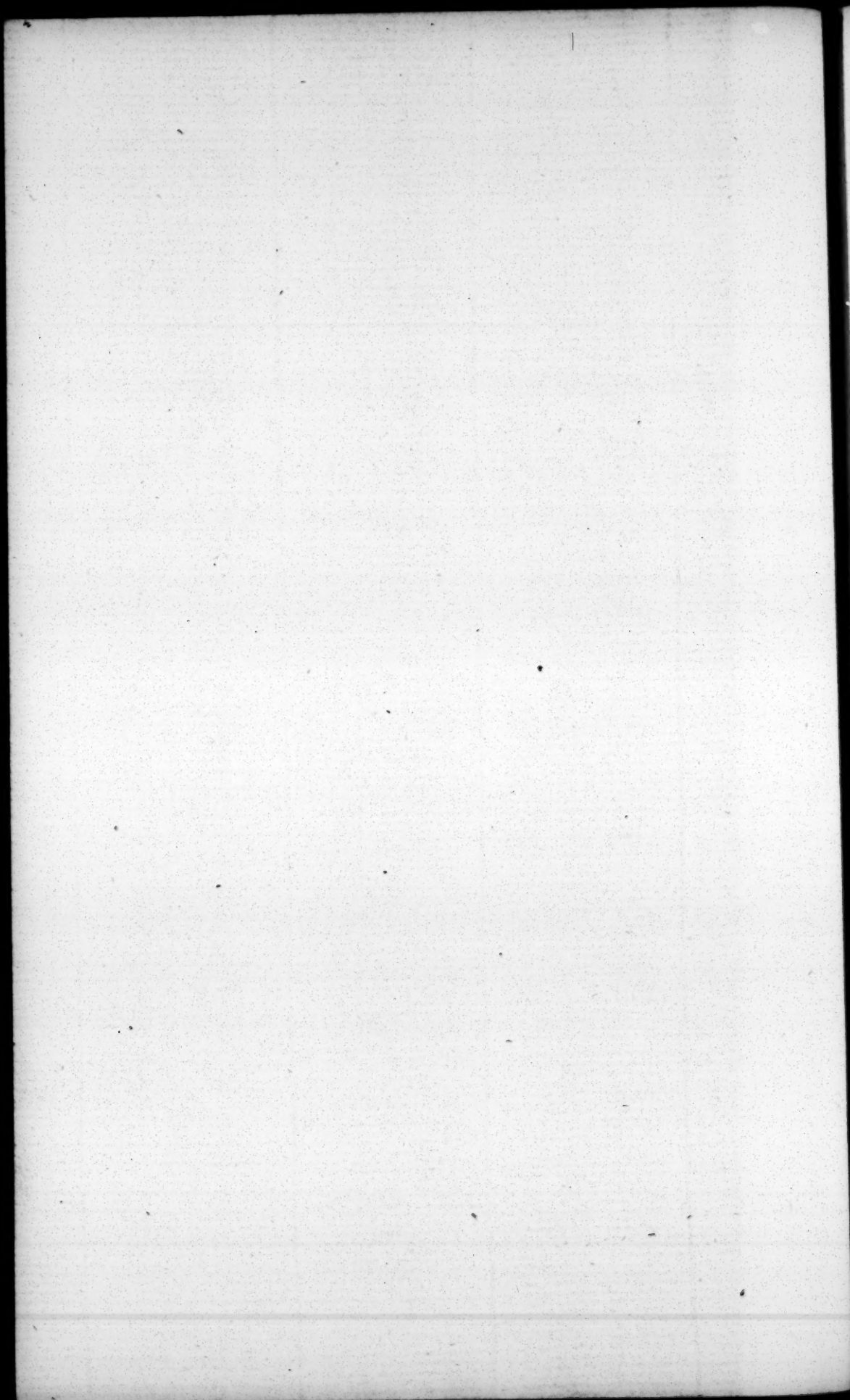
<i>Comp. by Sing.</i> <i>Elect. Attraction</i>	{	Sal Sedativus	{	Sapo Hispan.
		Alk. Fix.		Hepar Sulphuris Fossile
		Foss.		Sal Sedativus Ammon. Metallic and Earthy Salts.

By Double Elect. Attraction.

Decomp. by Sing. { *By the Vitr. Nitr. Muriat. Acet. and Tar-*
Elect. Attraction. { *tarous Acids.*

By Double Elect. Attraction.

Alk. Fix. Fossile	X	Alk. Volat.		Alk. Fix. Fossile	X	Alk. Volat.
Sal Sedativus		Ac. Vitr. Nitr.		Sal Sedativus		Ac. Mur. Acet.



SYNONIMA of the different NEUTRAL SALTS.

1. VITRIOLATED TARTAR.

Nitrum Vitriolatum.
Nitrum Stibiatum.
Sal Polychrestum.
Arcanum Duplicatum.
Sal de Duobus.
Sal Enixum Paracelsi.

2. GLAUBER SALT.

Sal Catharticum Glauberi.
Sal Mirabile Glauberi.
Vitriolum Nitrosum.

3. VITRIOLIC AMMONIAC.

Vitriolum Volatile.
Ammoniacum Vitriolicum.
Ammoniacum Secretum Glauberi.

4. COMMON NITRE.

Nitrum Vulgare.
Nitrum Lixiviosum.

5. NITRUM CUBICUM.

Nitrum Nitrosum.
Nitrum Quadrangulare.

6. NITROUS AMMONIAC.

Nitrum Volatile.
Nitrum semivolatile Boerhaavii.
Nitrum Ammoniacale.

7. DIGESTIVE SALT.

Sal Digestivum Sylvii.
Muria Lixiviosa.
Sal Marinum Regeneratum Boerh.
Spiritus falis marini coagulatus, P: L:

8. COMMON SALT.

Muria Nitrofa.
Sal Ciborum.
Alimentary Salt.
Sal Marinum.
Sea Salt.
Sal Fontanum.
Sal Gemmi.
Sal Montanum.

9. COMMON AMMONIAC.

Sal Ammoniacum Vulgare.
Sal Ammoniacum Crudum.
Muria Volatilis.

10. REGENERATED TARTAR.

Sal Diureticus.
Terra Foliata Tartari.
Arcanum Tartari.

11. SOLUBLE TARTAR

Tartarum Tartarifatum.

12. SALT of ROCHELLE.

Sal Rupellense.
Tartarum Nitrosum.
Sel de Seignette.

13. VEGETABLE AMMONIAC.

Spiritus Mindereri.

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O F
INFLAMMABLE BODIES.

The Bodies of this Class have been already defined.

All the Bodies of this Class derive their Inflammability from one and the same Principle, in each called PHLOGISTON.

The Properties of the PHLOGISTON in its separate State hath hitherto eluded our Examination.

It unites with the other Classes of Bodies, producing in them singular Properties.

It forms a chief and necessary Ingredient in all Metals, it has the singular Power of diminishing the absolute Weight of such Bodies with which it unites; this is illustrated by the Calcination of Metals, and the burning of Inflammable Bodies.

This Class of Bodies appears to us under the various Forms of PHOSPHORUS, OILS, SULPHUR, and ARDENT SPIRITS.

In these Bodies the PHLOGISTON may be considered as in a compound State, capable of being set loose by the Assistance of Heat and Air, in the Form of a luminous Vapour call'd Flame.

I. PHOSPHORUS of URINE.
PHOSPHORUS of KUNKEL.
PHOSPHORUS of Mr. BOYLE.

This PHOSPHORUS is prepared by Distillation from an inspissated Urine.

It may likewise be prepared by distilling from the native Salt of Urine with Charcoal, or any other Body which contains PHLOGISTON.

The best Process is that by Margraaf in his Opuscules Chimique.

PHOSPHORUS is a compound Body which consists of the PHLOGISTON so slightly united to an Acid, that

the Heat of our Atmosphere is sufficient to decompose them; hence it burns in the Air and appears luminous in the Dark.

2. PYROPHORUS of HOMBERG,

Is a Chymical Preparation, which has the singular Property of catching Fire when exposed to the Air.

It may be considered as a Species of PHOSPHORUS, where PHLOGISTON adheres very slightly to an Acid, from the Interposition of an Earthy Body, which weakens its Attraction.

It is prepared by calcining three Parts of Alum with one Part of Sugar: or it may be prepared by any other Salt which contains the Vitriolic Acid calcined with Honey, Flower, or any Vegetable or Animal Substance which contain PHLOGISTON.

OF O I L S.

They are compound Bodies, not soluble in Water; their Flame is accompanied with Smoke and Soot, leaving a black Residuum in Distillation.

They are composed of PHLOGISTON, ACID, EARTH and WATER.

They are rendered Volatile by a Heat less than that which inflames them.

They are rendered more Volatile, and of less specific Gravity, by repeated Distillation, e. g. Ol. Animale Dipellii.

They are changed by the Air, their Volatile Parts are dissipated, they become thicker, and in some a Fermentation is excited.

VITRIOLIC ACID excites much Heat and inflames many Oils, its Fumes thereby become more Volatile and Sulphureous.

The NITROUS ACID acts still with more Violence.

The MURIATIC ACID has little Action upon Oils.

OILS unite with SULPHUR, and compose BALSAMS of SULPHUR.

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They unite with Alkalis into Soap.

They dissolve the Calces of Lead with which they form the Basis of our Plaisters.

OILS are either ANIMAL, VEGETABLE, or FOSSIL.

The ANIMAL and VEGETABLE OILS are either EXPRESSED, ESSENTIAL, or EMPYREUMATICAL.

The FOSSIL OIL, which is probably of one Kind only, appears to us under the Forms of

1. Naptha.
2. Petroleum.
3. Barbadoes Tar.
4. Asphaltum Bitumen Iudaicum.
5. Ambergrese.
6. Amber.

SULPHUR is a Compound Body of the Phlogiston united with the Vitriolic Acid.

SULPHUR is very frequent in the Earth in its native Form.

It is distinguished by its Flame ; by its Smell when burnt ; by its producing a Hepar Sulphuris when mixed with a fixed Alkali.

SULPHUR is found most frequently united with Metals in the Earth in the Form of Pyrites.

OF ARDENT SPIRITS.

They are produced by Distillation from Vegetable Saccharine Juices, which have undergone Fermentation ; hence they are called Rum, Brandy, Malt Spirits, all of which, by repeated Distillation, lose their peculiar Flavours, and when highly rectified are called Alcohol.

Its specific Gravity is best ascertained by the Hydrometre. It is very volatile.

It unites with Acids and forms Æthers.

It dissolves Alkaline Substances, and some Neutral Salts.

It dissolves all the Oils except the Expressed, which it only dissolves when they are attenuated by repeated Distillation.

OF METALS.

Metallic Bodies have been already defined.

They are Compound Bodies consisting of Phlogiston, with an Earth called their Calx.

The Phlogiston is the same in all of them; their specific Difference arises from the Nature of their Earthy Part.

The Attraction of the Phlogiston to their Earthy Part is in different Degrees of Strength in different Metals.

Metals are found in the Bowels of the Earth, either

1. Native.
 2. Mineralized.
 3. Calcined.
 4. Dissolved.
-

OF GOLD.

It is the heaviest of all Metals.

It is the most ductile of all Metals.

It cannot be changed by Air.

It cannot be calcined by Heat.

It is soluble in Aqua Regia.

It is soluble in Hepar Sulphuris.

It requires a strong Heat to melt it.

It amalgamates with Mercury.

It is most frequently found in the Earth in its native and pure Form, because it admits of no Union with Sulphur.

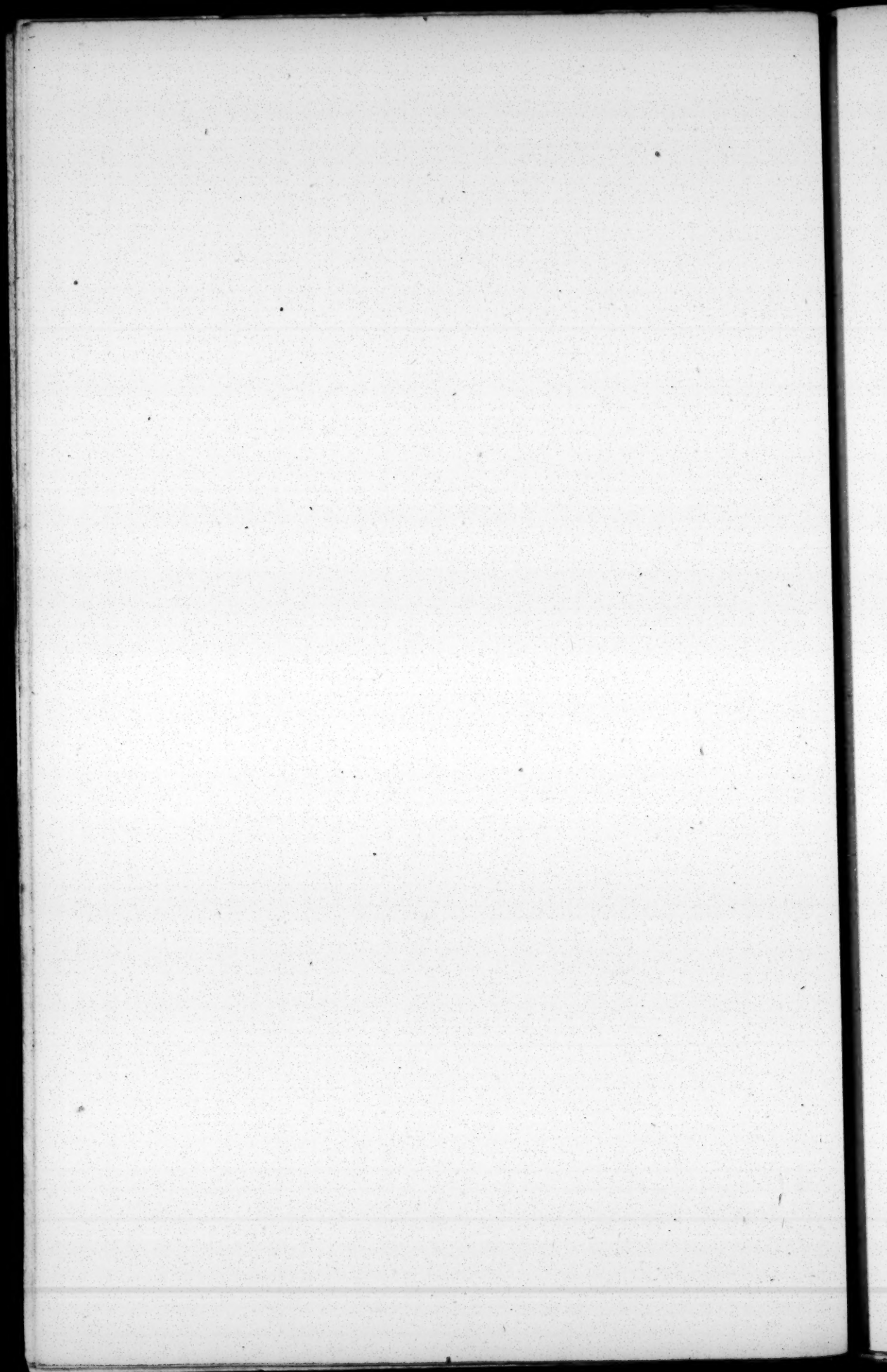
It is separated from stony or earthy Matters by washing, and amalgamating it with Mercury.

It is separated from base Metals by the Cupel.

It is separated from Silver by Aqua Regia.

It is separated from Aqua Regia by the Volatile Alkali, in the Form of Aurum Fulminans.

It is separated from Aqua Regia by Æther, Spirit of Wine, or Essential Oils, in the Form of Aurum Potabile.



OF SILVER, which is

Of a white shining Colour.

Of less specific Gravity than Gold.

Of much less Ductility.

It is unalterable in Air, Water, or Fire.

It dissolves in Spirit of Nitre.

It amalgamates with Quicksilver.

It takes a reddish, yellow, or black Colour, when exposed to the Fumes of Sulphur.

It is not calcined by the Glass of Lead.

It is rendered Volatile by Antimony, Zinc, or Muriatic Acid.

It melts easier than Copper.

It is found,

1. Native.
2. Mineralized with Sulphur and Arsenic, in Iron, Copper, Antimony, Zinc, and Lead Ores.
3. Saline with Muriatic Acid.

Minera Argenti cornea.

SILVER is employed in Medicine united with the Acid of Nitre :

1. Lunar Caustic.
 2. Lunar Pill of Mr. Boyle.
-

OF QUICKSILVER.

It is always fluid in the Heat of our Atmosphere.

It has however been rendered solid by greater Degrees of Cold, in which State it is ductile.

It is very volatile in the Fire.

Its specific Gravity is next to that of Gold.

It attracts and unites very readily with all Metals, except Iron, Cobalt, and Nickle.—For the Degree of its Attraction, Vide Table of Elective Attractions.

It may be calcined by Heat.

It is converted into a greyish Powder by a long Triture, either by itself or the Interposition of other Bodies.

It dissolves in the Acid of Vitriol by a strong boiling.

It is easily dissolved in the Spirit of Nitre.

In its metallic State it is not soluble in the Muriatic Acid, but may be rendered soluble in that Acid, and in Vegetable Acids, after having been previously dissolved by other Acids.

It unites readily with Sulphur, either by Triture, by Solution, or by Distillation.

The Sulphur is separated from it by Iron or by Alkaline Salts.

It is found in the Bowels of the Earth,

1. In its native or metallic State,
2. In its mineralized State united with Sulphur in the Form of Cinnabar.

The following Table expresses the various Preparations of Mercury, which are employed in Medicine.

A. Crude.

Hydrargyrus purificatus L.

B. In Vapour.

Mercurius ad fuffumigia

C. Triturated.

a. alone.

Trajea Keyferi

b. with Honey.

Pilulæ Mercuriales

c. with Balsam.

Pilulæ Mercuriales L.

Unguentum cæruleum fortius et mitius L.

Emplastrum commune cum Mercurio L.

Ceratum Mercuriale L.

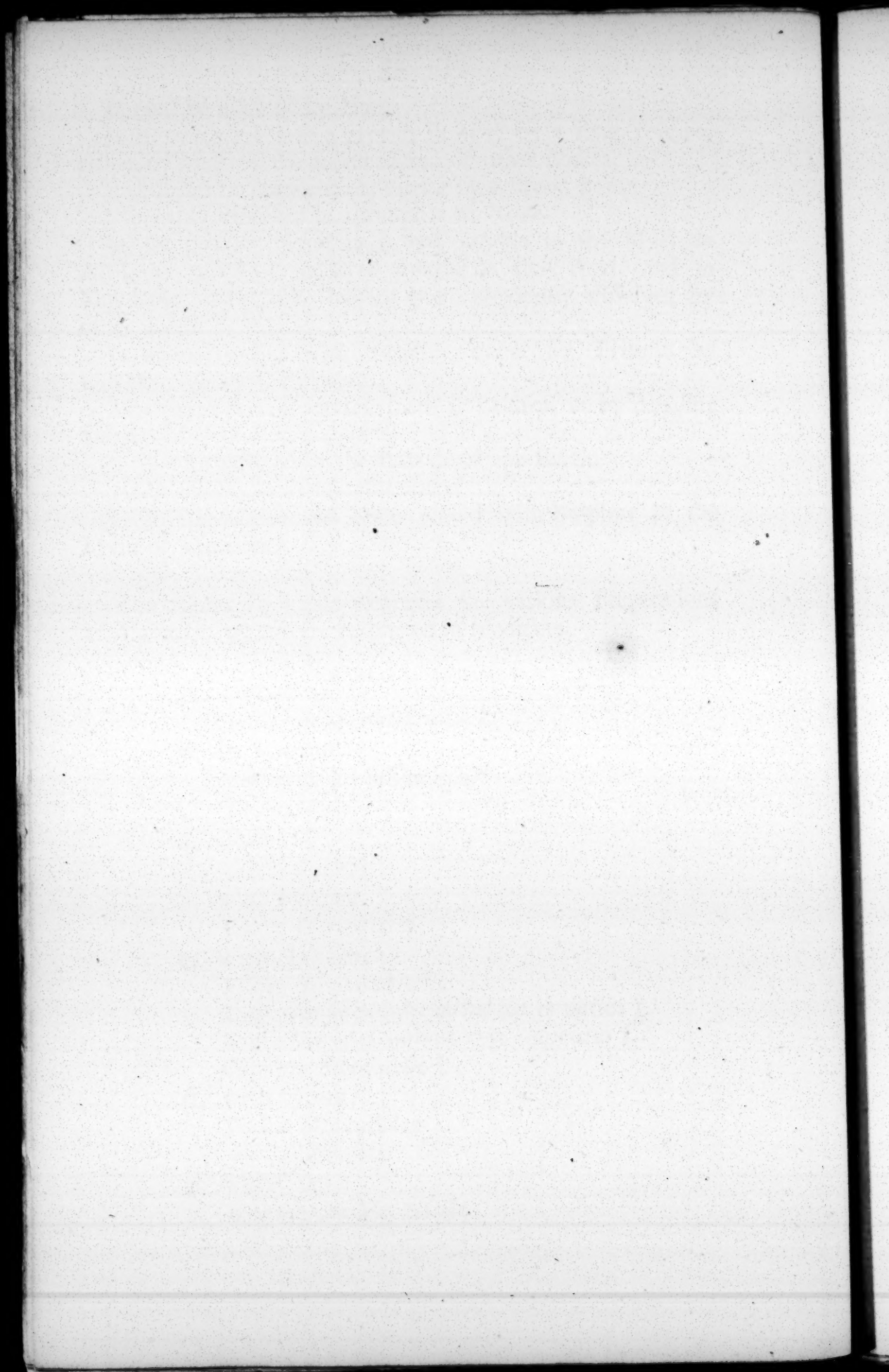
d. with Resin.

Pilulæ Mercuriales

Æthiopicæ

e. with Suet.

Unguentum Mercuriale



f. with Absorbents.

Mercurius alcalifatus

g. with Sugar.

Mercurius saccharatus

h. with Sulphur.

Æthiops mineralis L.
antimonialis

D. Sublimed with Sulphur.

Cinnabaris factitia
antimonii

E. Calcined.

a. alone.

Mercurius calcinatus L.
præcipitatus per se

b. with Gold.

Mercurius præcipitatus solaris Astruc.

F. Rendered saline.

a. by Vitriolic Acid.

Mercurius emeticus flavus L.
Mercurius præcipitatus flavus
Turpethum Minerale

b. by Nitrous Acid.

Solutio Mercurii
Calx Mercurii

c. by Muriatic Acid.

Mercurius sublimatus corrosivus L.
præcipitatus albus Boerh.
Aqua aluminosa
phagedænica

Mercurius violaceus diaphoreticus Astruc.

Flores ammoniaco Martiales

Solutio Mercurii per deliquium Astruc.

d. by Vegetable Acid.

Mercurius tartarifatus
Keiser's Pills

G. Saline Preparations corrected.

a. Rendered mild.

aa. by abstracting Acid.

aaa. by Calcination.

Mercurius corrosivus ruber L.
calcinatus
præcipitatus ruber

bbb. by Attraction.

aaaa. of Water.

Pulvis Principis Lewis

bbbb. of Alcohol.

Mercurius corallinus Lewis
Panacæa Mercurii

cccc. of Water and Alcohol.

Arcanum corallinum Lewis
Panacæa Mercurii rubra Lewis

ccc. by Attraction and Precipitation

aaaa. of Fixed Alkali.

Mercurius præcipitatus fuscus 1744.

bbbb. of Volatile Alkali.

Mercurius præcipitatus albus

cccc. of Fixed and Vol. Alkali.

Mercurius præcipitatus albus L.
Unguentum e Mercurio præcipitato L.

dddd. of Vol. Alkali and Copper.

Mercurius præcipitatus viridis

bb. by Addition of Mercury.

Mercurius sublimatus dulcis L.
calomelas.

Aquila alba

cc. by Addition of Unguent.

Unguentum citrinum

b. rendered acrid or kept so.

aa. by redissolving Precipitate.

Mercurius præcipitatus solutus

bb. by Addition of Acid.

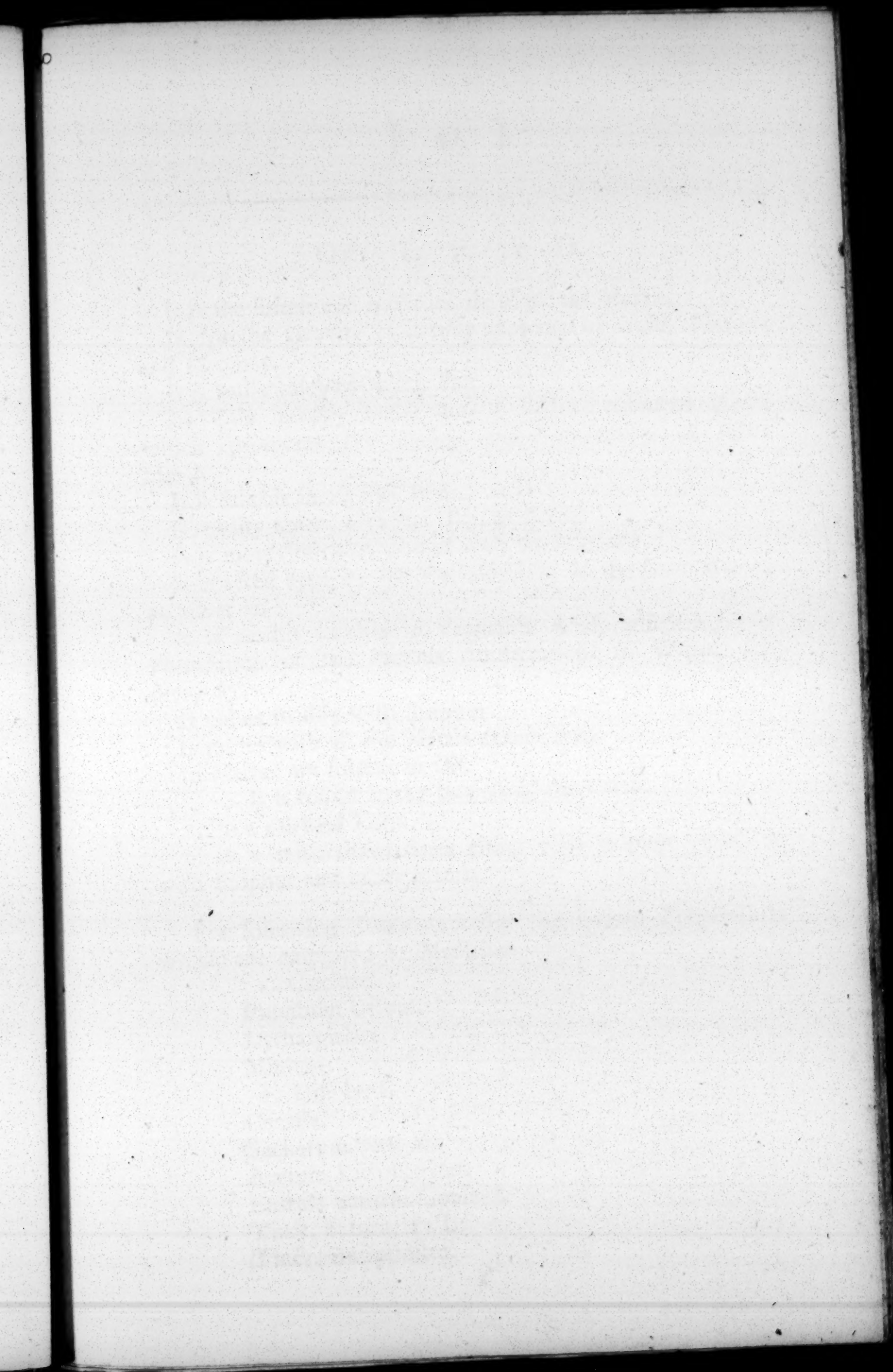
Solutio sublimati cum spir. falis

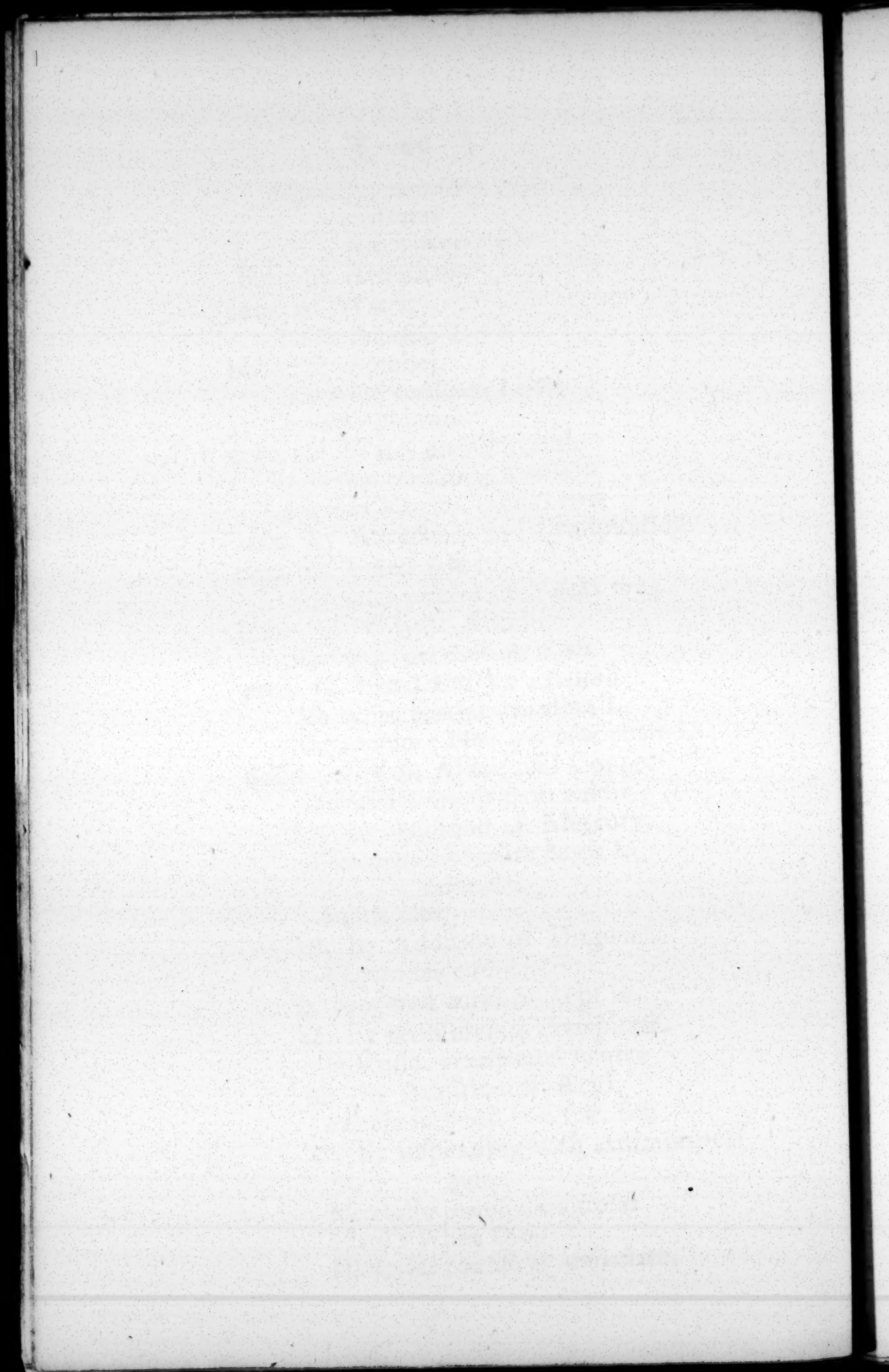
cc. by suspending with Ammoniacal
Salt.

Mercurius corrosivus nitrosus

Ward's White Drop

Mercurius corrosivus muriaticus,





OF LEAD.

It is the softest and most ductile of all the Metals.

In specific Gravity it is only exceeded by Gold, Platina, and Mercury.

It is easily calcined in the Fire.

Its Calx readily melts into a yellow coloured Glass, which promotes the Fusion and Calcination of other Metals.

It is soluble in all the Acids.

It readily unites with the Nitrous Acid.

It is more difficultly united with the Vitriolic.

It is acted upon by the Muriatic Acid in the same Manner as Silver is.

It is readily soluble in Vegetable Acid, which lays the Foundation of the various Adulterations in Wines, Cyders, &c.

It unites readily with Sulphur.

It unites with all the Metals except Iron.

Its Calces are soluble in Oil.

It is found in the Bowels of the Earth,

1. In a calcined Form.
2. In a mineralized State either with Sulphur alone, or with Sulphur and other Metals.

The following Table expresses the various Preparations which are employed in Medicine.

1. Calcined.

Plumbum Ustum.

Lythargirites.

Minium.

2. Dissolved.

Cerussa.

Sacharum Saturni.

Acetum Lithargirites.

Extract Saturni Goulard.

Tinct. Saturn. P: L:

Tinct. Antipthifica.

O F T I N.

It is the most fusible of all Metals.

It is easily calcined in the Fire.

Its Calx is very difficultly converted into Glafs.

Its Calx easily mixes with Glafs, and makes the white Enamel.

It makes most Metals with which it unites very brittle.

It amalgamates easily with Quicksilver.

It is acted upon by all the Acids.

The Vitriolic Acid, when heated, readily dissolves it.

The Nitrous Acid acts upon it with great Violence, but rather corrodes than dissolves it.

The Muriatic Acid dissolves it very perfectly.

It is dissolved in largest Quantity in Aqua Regia, which Solution when mixed with a Solution of Gold in Aqua Regia produces the purple Precipitate of Cassius.

It heightens the Colour of Cochineal.

In the Bowels of the Earth it is found in a Calciform State.

The following are its Preparations employed in Medicine.

Stannum pulveratum.

Calx Jovis.

Sal Jovis.

Aurum Musivum.

O F C O P P E R.

It is a very elastic, ductile, and sonorous Metal.

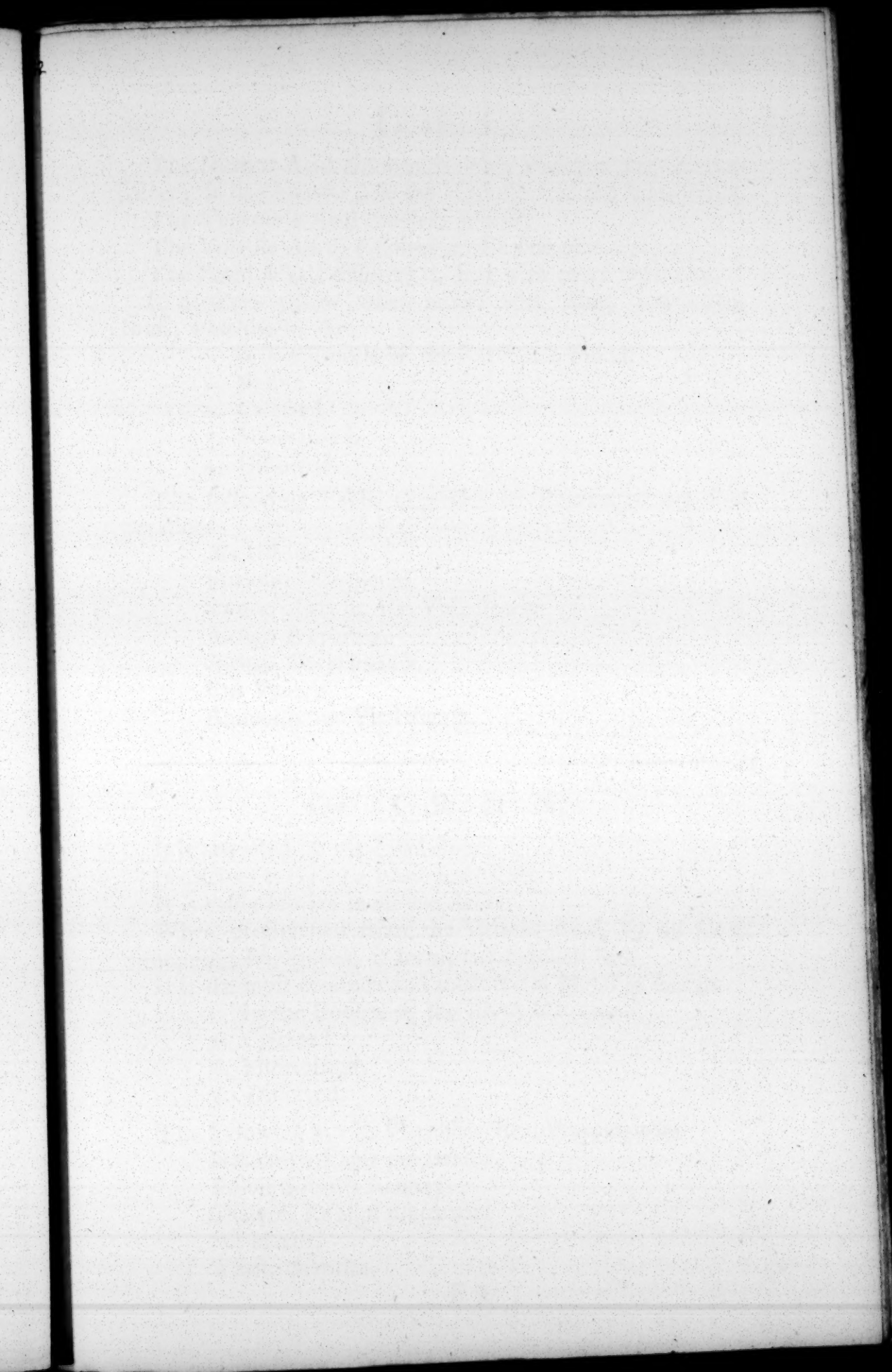
It is of difficult Fusion.

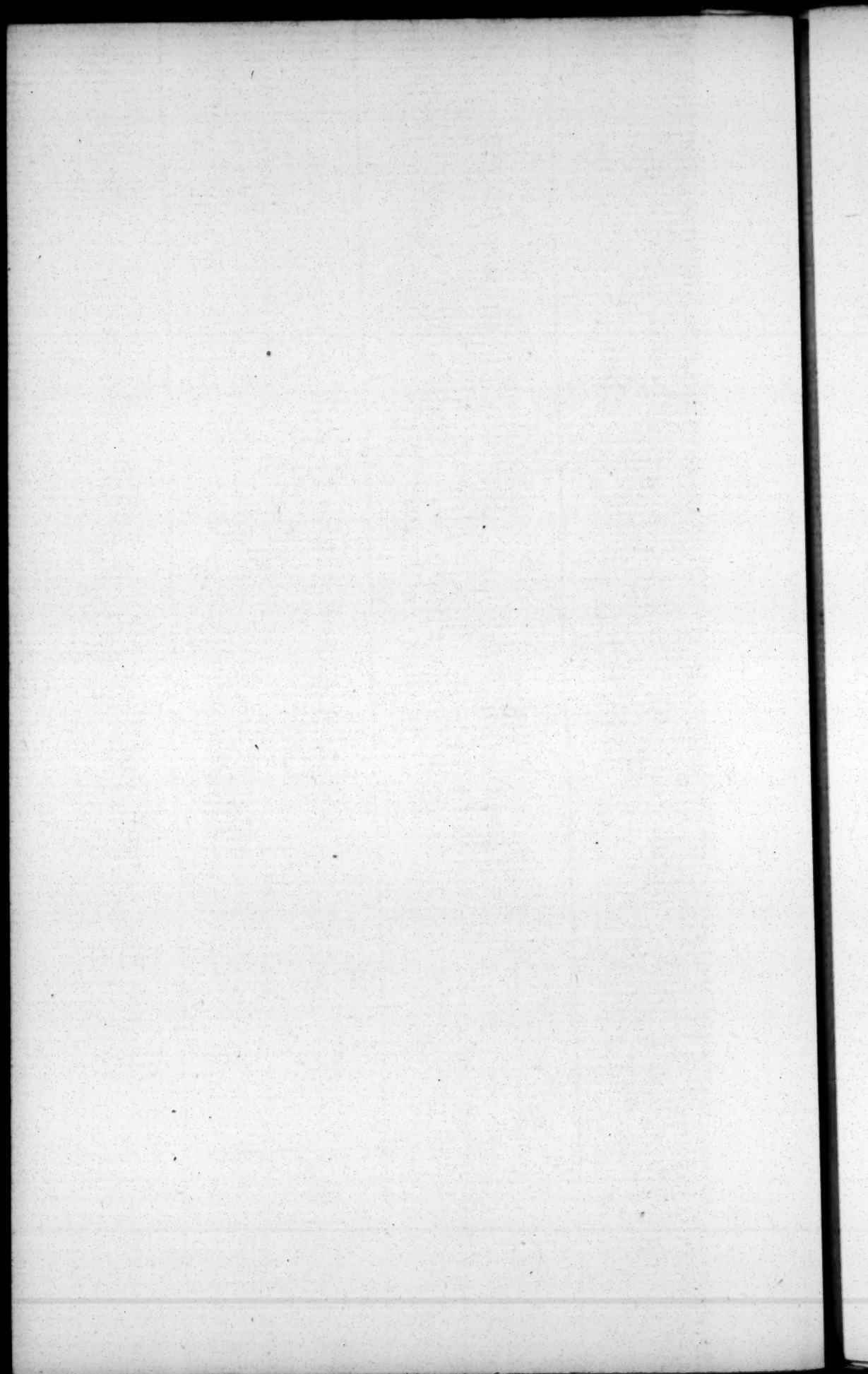
It is calcinable in the Fire.

It is easily acted upon by Air and Water.

All the Acids dissolve it readily.

The Vitriolic Acid dissolves it with more Difficulty than any of the others.





The Nitrous Acid dissolves it with Violence and Effervescence; in like Manner does the Muriatic Acid and Aqua Regia.

The Vegetable Acid dissolves it easily.

The Volatile Alkali dissolves it of a fine blue Colour.

The Fixed Alkali dissolves it, but with more Difficulty.

It becomes yellow when mixed with Zinc, and makes Brass, Pinchbeck, &c.

In the Bowels of the Earth it is found,

1. Native.
2. Calcined.
3. Mineralized.
4. Dissolved.

The following Table expresses its Pharmaceutical Preparations.

Æs Ustum.

Vitriolum Ceruleum.

Solutio Æris in Alk. Vol. Boerh.

Ærugo Preparata.

Ærugo Chrystalizata.

Ens Veneris.

Ammoniacum Vitriolicum.

OF I R O N.

It is attracted by the Load-stone.

It calcines easily to a black scaly Calx.

It is easily soluble in all the Acids.

When precipitated from the Vitriolic Acid, by an Alkali containing Phlogiston, it forms the Prussian Blue.

It is the most common and most useful Metal in Nature.

In the Bowels of the Earth it is found,

1. Calcined.
2. Mineralized.
3. Dissolved.

The following are its Pharmaceutical Preparations.

Hæmatitis Lapis preparatus.

Pulvis Subtilis Lemery.

Chalybis Rubigo preparata.

Sal Martis.

Tinct. Styptica.

Vitriolum Calcinatum.
 Colcothar Vitrioli.
 Chalybs cum Sulphure preparat.
 Tinct. Martis in Spir. falis.
 Flores Martiales.
 Lixivium Martis.
 Vinum Chalybeatum.

OF Z I N C.

It melts easily and inflames in the Fire.
 It unites easily with all Metals, except Bismuth.
 It is soluble in all the Acids.
 It is found in the Bowels of the Earth in a calcined State.
 The following are its pharmaceutical Preparations.
 Lapis Calaminaris preparatus.
 Tutia preparata.
 Sal Vitrioli.
 Vitriolum Album.

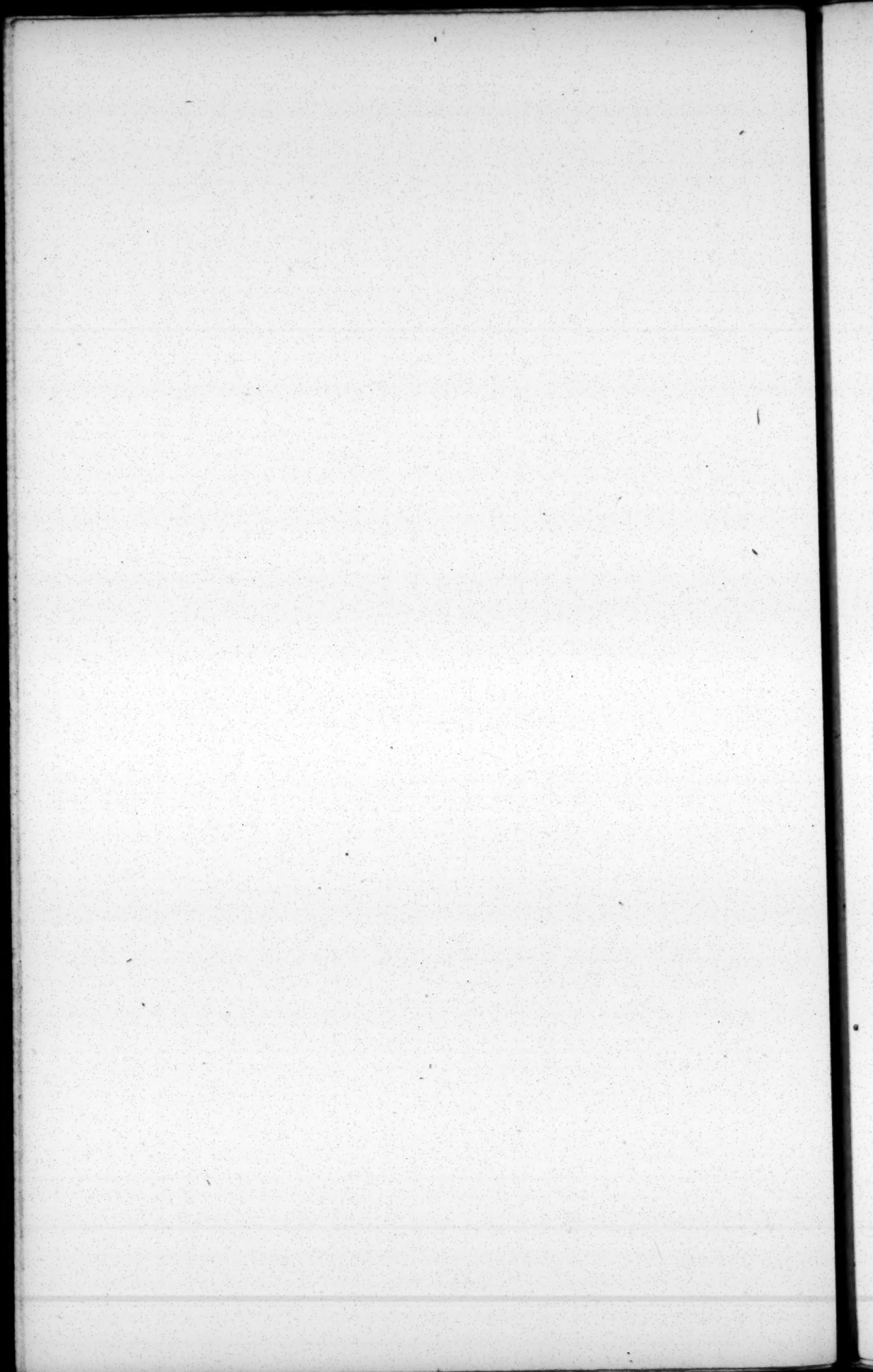
OF A N T I M O N Y.

It is very Volatile in the Fire, and Volatilizes along with it all Metals, except Gold and Platina.
 It is calcined in the Fire by a moderate Degree of Heat into a light grey Calx, which may be fused into a Glass of a reddish brown Colour.
 It may be dissolved and kept suspended by all the Acids, except the Nitrous, which only corrodes it into an inert Powder.

In the Bowels of the Earth it is found,

1. Native.
2. Mineralized with Sulphur alone and some Metals.

The following Table expresses its pharmaceutical Preparations.



A. not saline.

a. Regulus with different Proportions of Sulphur.

Antimonium crudum preparatum L.
Regulus medicinalis
Kermes minerale
Sulphur antimonii præcipitatum L.
Sulphur auratum antimonii
Pilul. Plummeri

b. Regulus alone.

Regulus antimonii simplex
Martialis

c. Reguline parts calcined

aa. without Addition.

Antimonium crudum incineratum
Vitrum antimonii
ceratum antimonii

bb. with Addition of Nitre.

Crocus antimonii mitior Lewis
Crocus antimonii
———metallorum
———antimonii lotus L.
Pulvis febrifugus Nosocom.
Antimonii emeticum mitius Boerh.
Antimonium diaphoreticum nitratum
————— lotum

Calx antimonii L.

Antihæcticum Poterii 1744

B. render'd saline.

a. by Vitriolic Acid.

Antimonium vitriolatum Werholf,

b. by Nitrous Acid.

Bezoardicum minerale
—————Joviale

c. by Muriatic Acid.

Butyrum antimonii
Causticum antimoniale L.
Mercurius vitæ

d. by Vegetable Acid.

Sapa vomitoria Sylvii.

Vinum antimoniale L.

———emetikum

Tartarum emeticum.

OF B I S M U T H.

It is very fusible, calcines, and scorifies more easily than Lead.

It may be mixed with the other Metals, except Cobalt and Zinc, and makes them white and brittle.

It dissolves readily in the Nitrous Acid, and in Aqua Regia, from which it may be precipitated by pure Water into a white Powder called Spanish White.

It amalgamates easily with Quicksilver.

It is found in the Bowels of the Earth,

1. Native.
2. Calcined.
3. Mineralized.

It is not employed in Medicine.

OF A R S E N I C.

It is very volatile in the Fire, burns with a small Flame, and exhales a disagreeable Smell like Garlick.

It is chiefly produced by Sublimation from the Ores of Cobalt, in the Form of a white Calx, called white Arsenic; when this Calx is blended with Sulphur it becomes yellow, and sometimes red, called Orpiment and Sandarich.

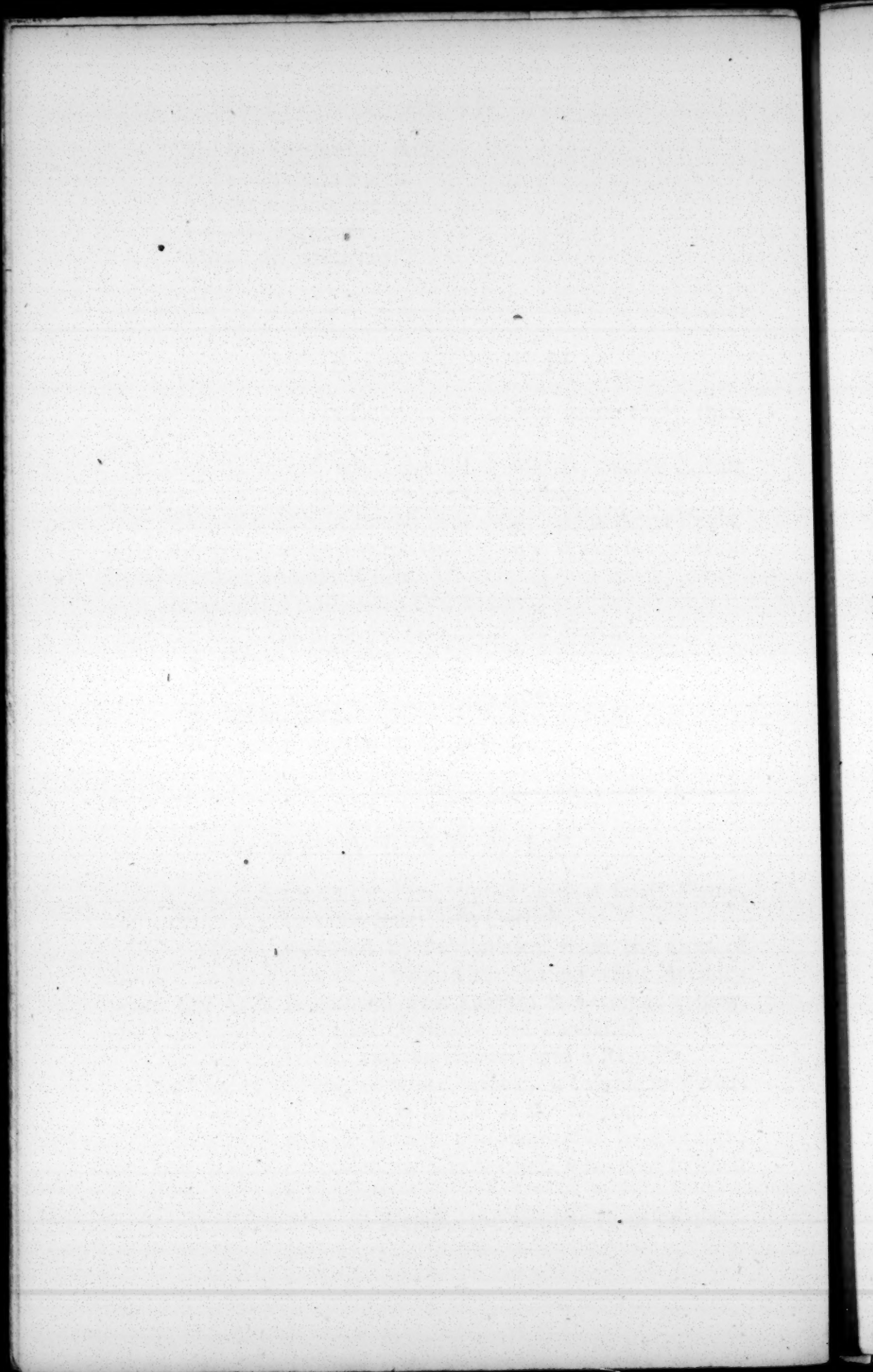
The Calx of Arsenic may be reduced into a Regulus.

The Calx of Arsenic, or white Arsenic, is soluble in Water.

The Regulus of Arsenic is soluble in the Nitrous Acid.

The Calx of Arsenic is more poisonous than its Regulus; and both have their poisonous Effects much weakened by their Combination with Sulphur.

Arsenic unites with all Metals, and renders them brittle.



It is found in the Bowels of the Earth,

1. Native
2. Calcined
3. Mineralized.

It is not safely employed internally in Medicine.

OF PLATINA.

It is very refractory in the Fire.

It is difficultly amalgamated with Quicksilver.

It is inferior to Gold in specific Gravity.

It can only be dissolved by Aqua Regia.

It does not unite with Sulphur.

It is found native in the Spanish West-Indies, in Rio De Pinto, from whence it is brought into Europe.

OF COBALT.

It is very fixed in the Fire, and vitrifies into Glass of a fine blue Colour.

It is soluble in Acid of Vitriol, in Acid of Nitre, and in Aqua Regia, in which last it makes a sympathetic Ink.

The Calx of Cobalt may be dissolved by the Muriatic Acid, and by the Volatile Alkali.

It is found in the Bowels of the Earth,

1. Calcined
2. Mineralized.

It is not employed in Medicine.

OF NICKEL.

It calcines to a green Calx.

It dissolves in Nitrous Acid, Aqua Regia, and Muriatic Acid, and tinges all of them of a deep green Colour.

It is more difficultly dissolved by the Vitriolic Acid.

Its Precipitates are dissolved by the Volatile Alkali, which they tinge with a blue Colour.

It is found

1. Calcined.
 2. Mineralized
 3. Dissolved in the Acid of Vitriol.
- It is not employed in Medicine.

O F E A R T H S.

Earths are dry and solid Bodies, not inflammable, nor soluble in Oil, and after Fusion concrete into the Form of Glafs.

They are of four Kinds.

I. ABSORBENT EARTHS, which are soluble in Acids, and unite with fixed Air.

They have been named Alkaline Earths, and sometimes, though improperly, have been termed Calcareous Earths.

Calcareous Earths belong to the Class of Absorbent Earths.

They become friable when burnt in the Fire, and fall into a white Powder.

They lose considerably in their Weight by Calcination.

When calcined, they become soluble in Water, and extremely caustic, and are then called Quick Limes.

When thrown into Water, after being burnt, they generate a great Degree of Heat,

When burnt, they do not effervesce with Acids.

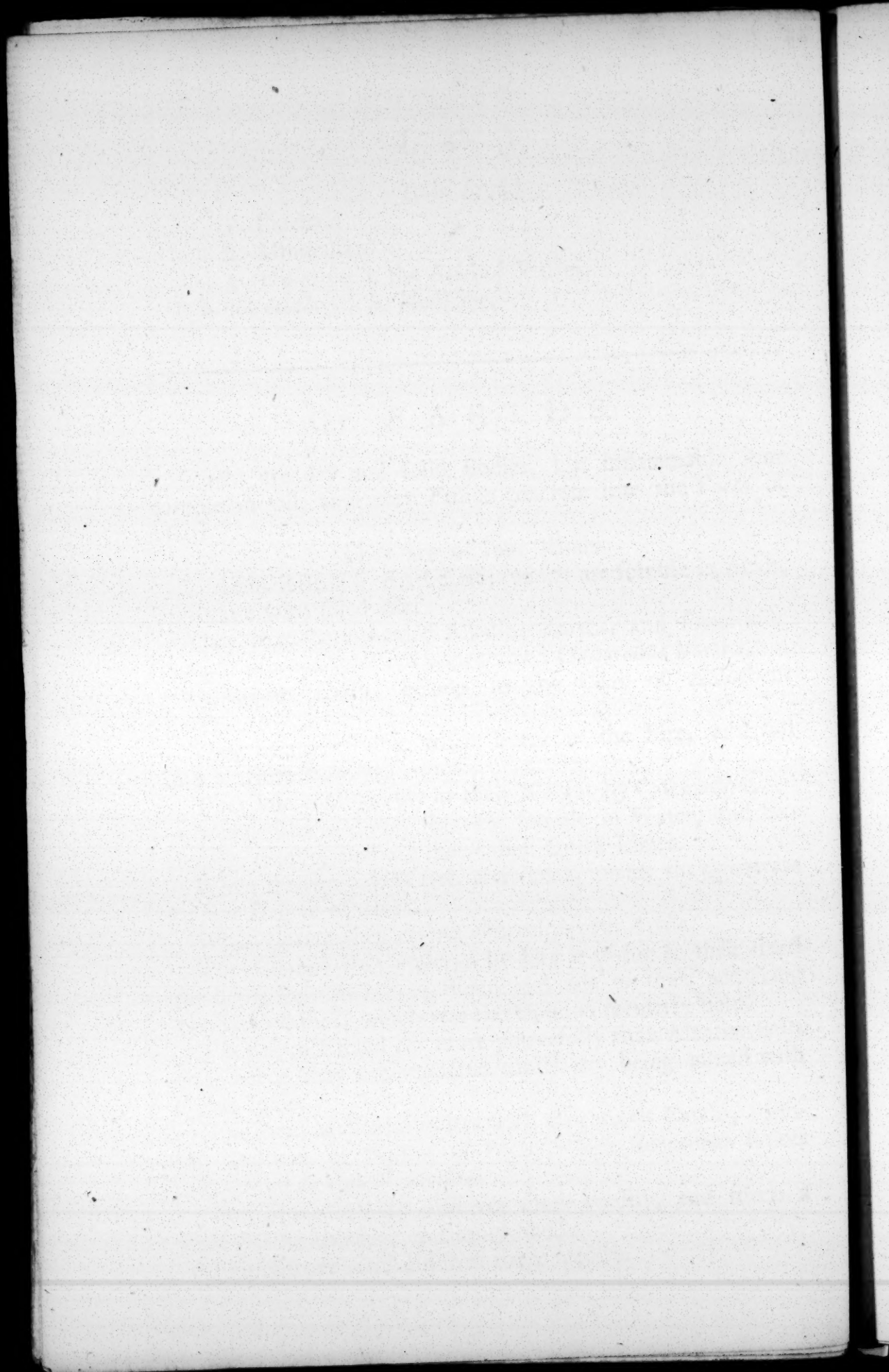
The Change they undergo by Fire is owing to their fixed Air being separated from them, and not to their acquiring Particles of Fire, which was the Opinion formerly held.

They attract fixed Air more powerfully than Alkaline Salts do; hence they are rendered caustic by being mixed with Quick-Lime:

The Acid of Vitriol unites with Calcareous Earths, forming Gypsum, or Plaster of Paris, which sometimes shoots into Chrystals called Selenites.

The Muriatic Acid dissolves them readily, and forms a fixed Sal Ammoniac, or Liquid Shell.

The Nitrous Acid dissolves them readily.



The Vegetable Acids do the same, unless they are much diluted with Water.

They are not fusible *per se*.

They melt easily with Borax, or the Sal Microcosmicum; with either of which they form a Glass.

They melt easily with the Calces of Metals, into a Glass.

They reduce the Calces of Lead or Bismuth.

Calcareous Earths are obtained from the Ashes of Plants, and the Bones and Shells of Animals.

In the Bowels of the Earth, they are in the Form of Chalk, Lime-stone, Marble, Calcareous Chrystallized Spar, Stalactites, &c.

In the Earth they are found united with,

1. Vitriolic Acid, called Gypsum.
2. Phlogiston, called foetid Spar or Lapis Suillus.
3. Phlogiston, and Vitriolic Acid. Liver-stone.
4. With Argillaceous Earth. Marle.
5. With Metallic Calces. White Iron Ore, White Copper Ore, or White Lead Ore.

Magnesia is an Absorbent Earth which unites readily with Fixed Air, but is not rendered Caustic by being deprived of it.

II. CHRYSTALLINE EARTHS. They are not soluble in Acids, and have Hardness sufficient to strike Fire with Steel.

When perfectly pure they cannot be melted without Addition.

They are called Vitrescent, because they melt into Glass with Alkaline Salts.

The purest and hardest Bodies of this Class are called Precious Stones.

1. Diamond; which is diaphanous and transparent.
2. Ruby; which is of a reddish Colour.
3. Sapphire; which is of a blue Colour.
4. Topaz; which is yellow or yellowish Green.
5. Emerald; which is chiefly Green.

Their distinguishing Property is their Hardness, they derive their Colours from particular Metallic Calces.

Quarts, Flints, Agates, Cornelians, Jaspers, &c. belong to this Class of Earths.

III. ARGILLACEOUS EARTHS. They are soluble in Acids, do not strike Fire with Steel, and are ductile upon the Application of Water.

In their greatest Degree of Purity they are very diffusible in Water, and of a white Colour.

They derive their Colours either from Phlogiston, or the Calces of Metals.

To this Class of Earths belong Porcellane Clay, French Chalk, Soap Rock, Boles, Earth of Alum, Marle, &c.

IV. TALKY EARTHS. Are of a fibrous or laminated Structure, not soluble in Acids, and incombustible in the Fire.

When they are of a laminated Structure, they are called MICA, MUSCOVY GLASS, which is frequently coloured by different Metals.

They consist of thin flexible Particles, divisible into Plates, or Leaves, with a shining Surface.

They become brittle by Heat.

They fuse into a Glass with Borax, or Alkaline Salts.

When they are of a fibrous and flexible Texture, they are called Asbestos, which from their Structure may be formed into Cloth or Paper.

OF WATER.

Water is a colourless, transparent Fluid, without Smell or Taste.

It becomes solid, and shoots into regular Chrystals, in the Heat of 32 Degrees of Farenheit's Thermometer.

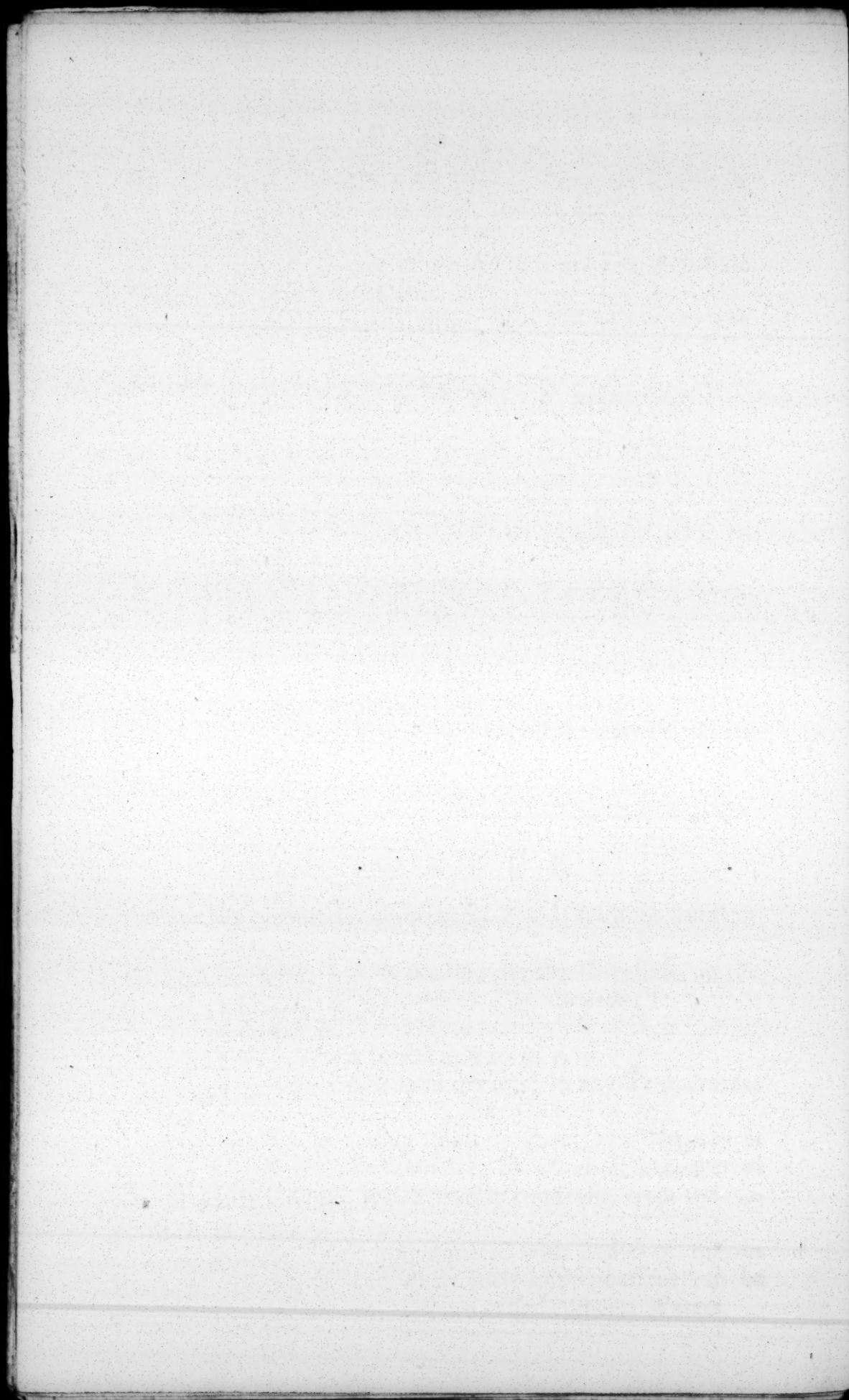
It is incompressible.

Its specific Gravity is to Air as 850 to 1.

It evaporates spontaneously in dry Air, in any Temperature of Heat.

In the open Air its boiling Point is about 212 Degrees of Heat in Farenheit's Thermometer, by which it is converted into an elastic Vapour, which readily condenses from the Application of Cold.

It is generally found impregnated with Bodies of various Kinds in the Earth, and when such Impregnations can be discovered by our Senses, they are called Mineral Waters.



The purest Water is Rain and Snow Water.

Water is a very universal Menstruum, and is capable of dissolving in a certain Degree most Bodies of the other Classes of Nature.

The Substances which are commonly present in Mineral Waters, are Compounds of the Vitriolic or Muriatic Acids, viz. Volatile Vitriolic Acid, Sulphur, Vitriolic Salts, with an earthy Base, viz. either Calcareous, Magnesia, or Earth of Alum. Vitriols with a metallic Base, either Iron, Copper, Zinc, &c. or Vitriolic Acid with an Alkaline Base, as Glauber Salt.

The Combinations with Muriatic Acid are either Common Salt, or Marine Salt, with an earthy Base.

The Fossil Alkali is frequently found pure in Mineral Waters.

Mineral Waters frequently contain a Volatile Æreal Principle, or fixed Air, which from some late Experiments is proved to dissolve Iron and other Substances.

OF ÆREAL BODIES.

Air is a Fluid permanently elastic.

It is of three Kinds.

1. Common Air.
2. Fixable or Mephytic Air.
3. Inflammable Air.

The 1st is the Atmospheric Air, which is necessary to Life and Flame.

It is very expansive, compressible, and of specific Gravity to Water as 1 to 850.

It promotes Evaporation by its Power as a Menstruum.

The 2d, or Fixable Air, is destructive to animal Life and Flame; it renders Caustic Alkalis mild; it restores Quick-Lime to its original State of Chalk. It is separated from the Lungs of breathing Animals, and from many Bodies, during their Fermentation.

The 3d, or Inflammable Air, is obtained from many Metals, such as Zinc, Iron, and Tin, by dissolving them in Acids: It is likewise separated from animal and vegetable Substances, in a State of Putrefaction.

T A B L E
O F
E L E C T I V E A T T R A C T I O N S.

I. *Acids.*
PHLOGISTON
Alkalis
Quick-Lime

Metals
Earth of Alum.

II. *Acids.*
Fixed Alkali
Quick-Lime
Magnesia
Base Metals
Volatile Alkali
Precious Metals.

III. *Acids.*
Calces of Metals
Volatile Alkali.

IV. *Vitriolic Acid.*
I ————— 4
I.

Zinc
Nickel
Cobalt
Iron
Copper
Silver
Tin
Lead
Mercury

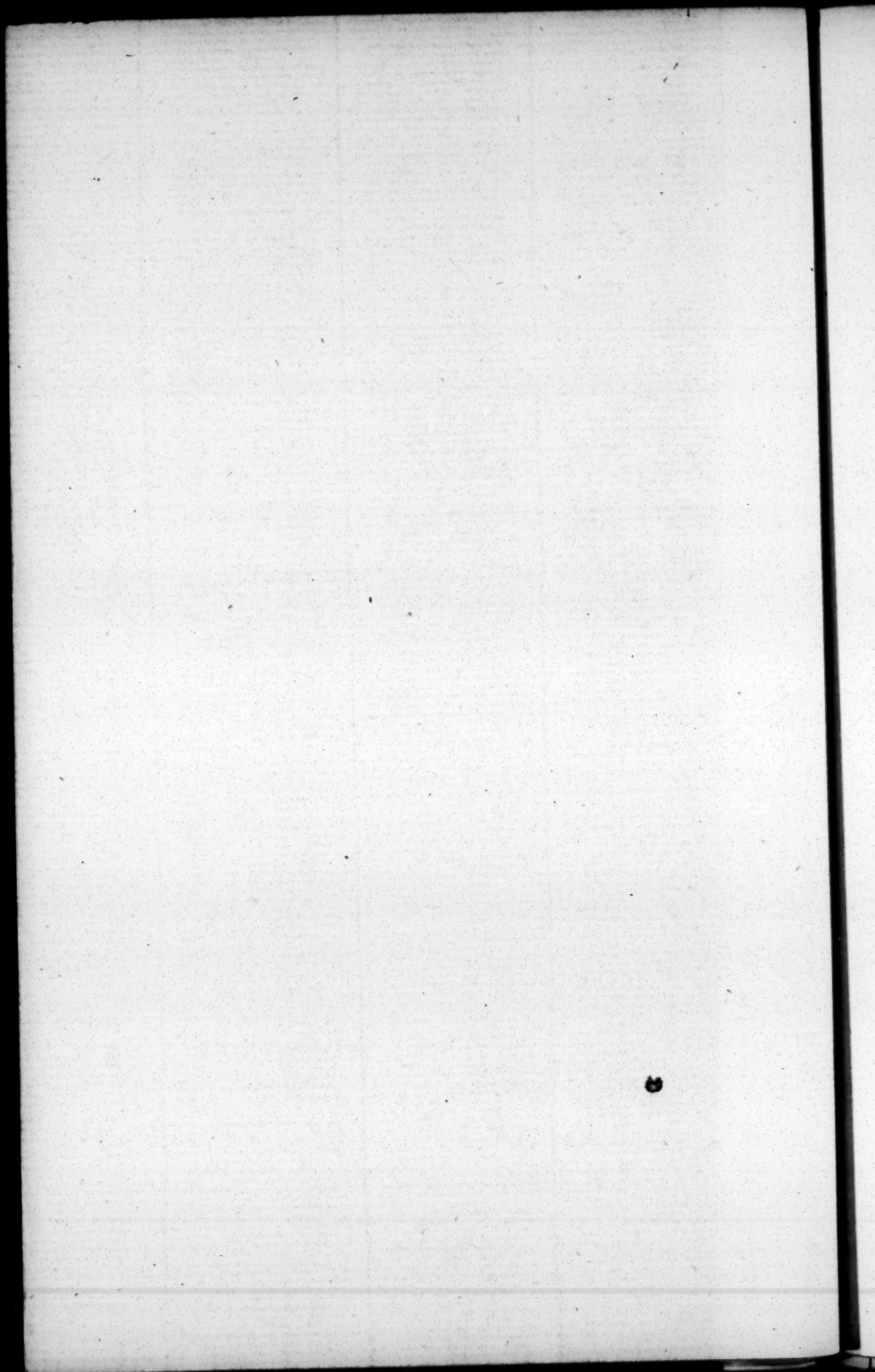
V. *Nitrous Acid.*

I ————— 3
I.
Zinc
Iron
Cobalt
Copper
Bismuth
Lead
Mercury
Antimony
Silver.

VI. *Nitrous Acid.*

I ————— 4
I.
Volatile Alkali
Magnesia
Zinc
Lead, Tin
Iron
Bismuth
Copper, Antimony
Arsenic, Earth of Alum
Mercury
Silver
Platina.





VII. *Muriatic Acid.*

I ————— 4
 Zinc I.
 Iron
 Tin
 Antimony, Copper.
 Lead
 Silver
 Mercury.

VIII. *Vegetable Acid.*

Zinc
 Iron
 Copper
 Lead.

IX. *Aqua Regia.*

I ————— 4
 Zinc I.
 Tin
 Gold.

X. *Aqua Regia.*

Zinc
 Platina.

XI. *Aqua Regia.*

Iron.
 Platina.

XII. *Aqua Regia.*

Copper
 Platina.

XIII. *Aqua Regia.*

Tin
 Platina.

XIV. *Aqua Regia.*

Mercury
 Platina.

XV. *Aqua Regia.*

Nickel
 Platina.

XVI. *Alkalis.*

Vitriolic Acid
 Nitrous Acid
 Muriatic Acid
 Vegetable Acid
 Volatile Vitriolic Acid
 Sedative Salt
 Oil, Sulphur.

XVII. *Alkalis.*

Acid
 Air.

XVIII. *Absorbent
 Earths.*

Vitriolic Acid
 Nitrous Acid
 Muriatic Acid
 Vegetable Acid.

XIX. *Air.*

Calces of Metals
 Quick-Lime
 Fixed Alkali
 Magnesia
 Volatile Alkali.

XX. *Phlogiston.*

Nitrous Acid
 Vitriolic Acid
 Metals
 Fixed Alkali.

XXI. *Alcohol.*

Water
 Oil, Refin.

XXII. *Water.*

Spirit of Wine
 Volatile Alkali.

XXIII. *Water.*

Cauſtic Fixed Alkali
 Spirit of Wine
 Mild Fixed Alkali
 Neutral Salts.

XXIV. *Water.*

Caustic Fixed Alkali
Quick-Lime.

XXV. *Sulphur.*

Alkalis
Iron
Copper
Lead
Tin
Silver
Antimony
Mercury
Arsenic.

XXVI. *Sulphur.*

Mercury
Volatile Alkali.

XXVII. *Metals.*

Muriatic Acid
Vitriolic Acid
Nitrous Acid
Vegetable Acid.

XXVIII. *Lead.*

Vitriolic Acid
Muriatic Acid
Nitrous Acid
Vegetable Acid
Oil.

XXIX. *Antimony.*

Vitriolic Acid
Nitrous Acid
Muriatic Acid.

XXX. *Iron.*

Vitriolic Acid
Muriatic Acid
Nitrous Acid.

XXXI. *Copper.*

Vitriolic Acid
Muriatic Acid
Nitrous Acid,

XXXII. *Silver.*

Vitriolic Acid
Muriatic Acid
Nitrous Acid.

XXXIII. *Gold.*

Æther, Spt. Wine, Essen. Oil.
Aqua Regia.

XXXIV. *Silver.*

Lead
Copper.

XXXV. *Silver.*

Lead
Iron,

XXXVI. *Mercury.*

Gold
Silver
Lead
Tin
Copper
Zinc
Antimony.

XXXVII. *Mercury.*

Lead
Bismuth.

XXXVIII. *Mercury.*

Platina
Lead.

XXXIX. *Mercury.*

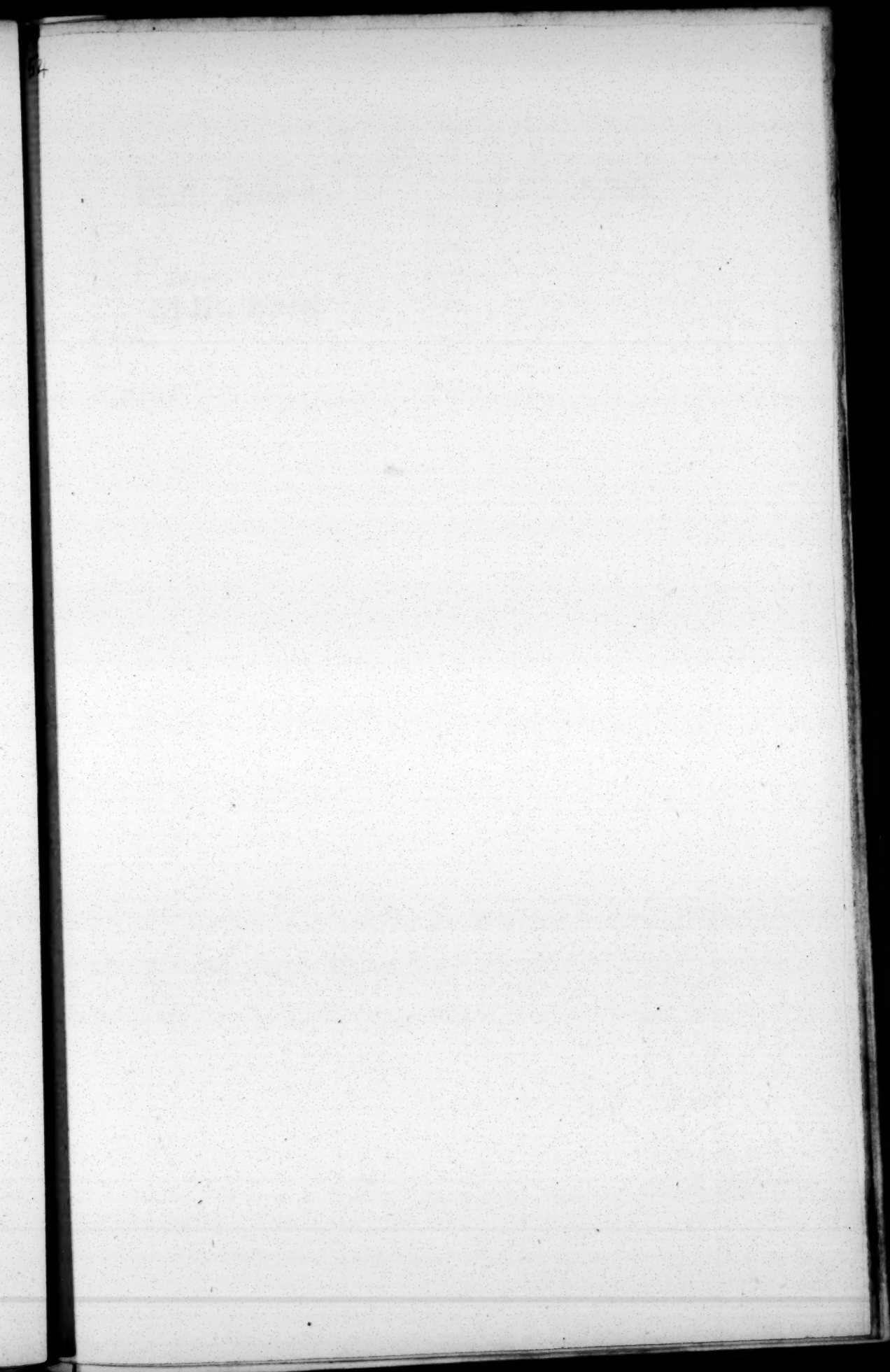
Gold
Platina.

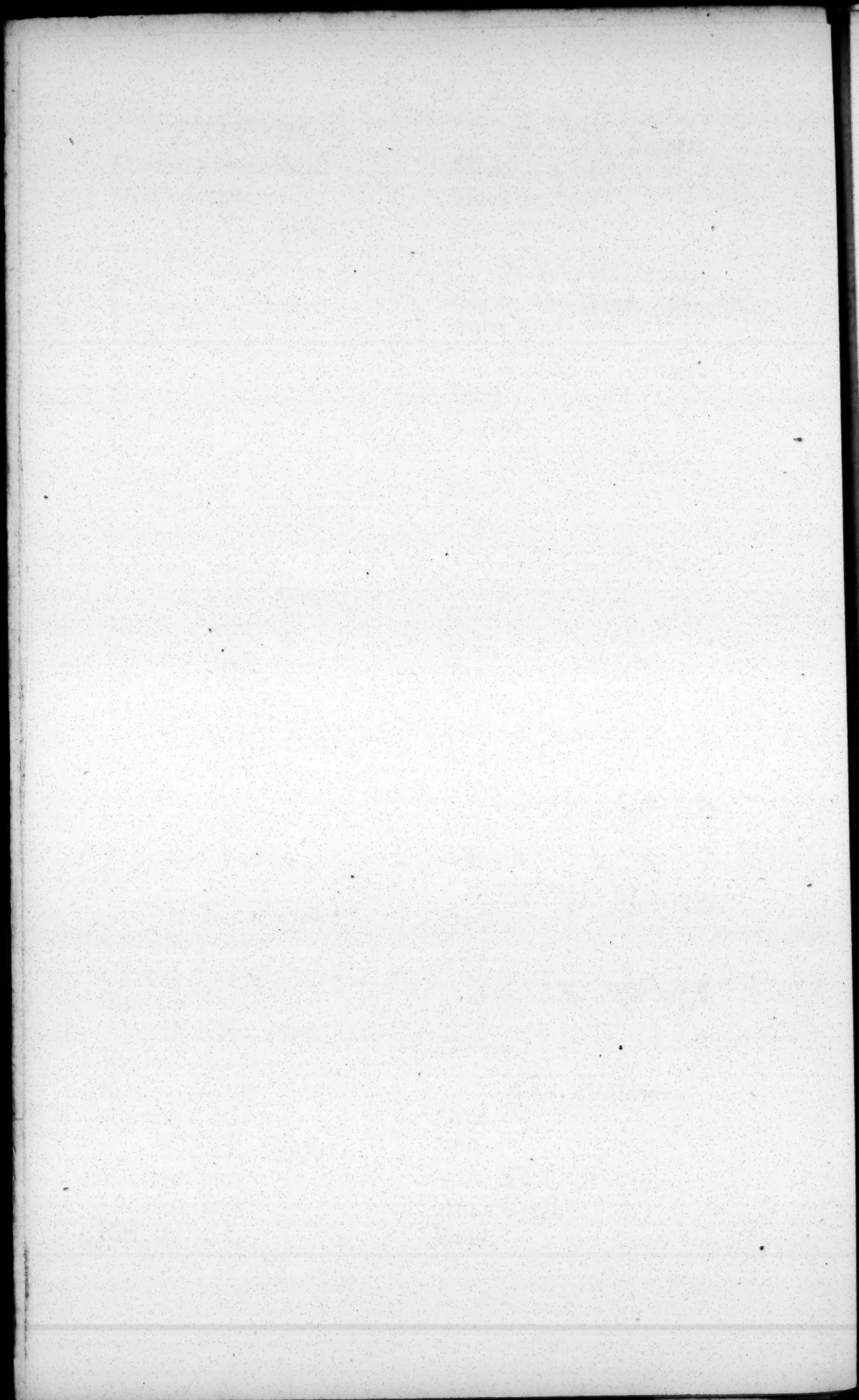
XL. *Platina.*

Lead
Iron.

XLI. *Platina.*

Aqua Regia
Gold.





XLII. *Antimony.*

Iron
Copper
Lead, Silver.

XLIII. *Nickel.*

Cobalt
Iron
Arsenic.

XLIV. *Arsenic.*

Zinc
Iron
Copper
Tin
Lead
Silver
Gold.

DOUBLE ELECTIVE ATTRACTION.

Corrosive Sublimate.	Muriatic Acid		Nitrous Acid		Lunar Caustic.
	Quick silver		Silver		
Common Salt, or Digestive Salt.	Muriatic Acid		Nitrous Acid		Nitrum Mercurii.
	Fixed Alkali		Quicksilver		
Glauber's Salt, or Vitriolated Tartar.	Vitriolic Acid		Nitrous Acid		Lunar Caustic.
	Fixed Alkali		Silver		
Green Vitriol.	Vitriolic Acid	6	Lead	Sugar of Lead.	
	3		3		
	Iron	6	Vegetable Acid		
Vitriolic Ammoniac.	Vitriolic Acid	30	Fixed Alkali	Regenerated Tartar.	
		20	20		
	Volatile Alkali	10	Vegetable Acid		
Selenites.	Vitriolic Acid		Oil	Soap.	
		15	4		
	Calcareous Earth		Fixed Alkali		

